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Acquisition

**INTEGRATED MASTER PLAN AND
SCHEDULE GUIDE**

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This pamphlet provides guidance on the Integrated Master Plan (IMP) and Integrated Master Schedule (IMS), which together, provide a systematic approach to program planning and scheduling. They also provide a tool for improved day-to-day program execution and for improved program/project insight by both Government program/project office personnel and contractor personnel. Previously a number of draft or final IMP/IMS guides have existed at various DoD acquisition locations. These guides were not always consistent in content and/or application. Also, a great deal of time and resources has been spent getting both the Government teams and the offerors/contractors up to speed on how to prepare and use the IMP and the IMS. A mutual understanding of what is required to successfully plan and execute a program is critical to the Government-industry team.

This pamphlet was developed to:

- Provide a consistent philosophy and approach to the IMP/IMS.
- Help create improved IMP/IMS products that reflect a systematic approach.
- Be fully tailorable to each program or project's specific needs and to permit offerors to build their IMP/IMS consistent with their own management and scheduling system structures and formats.
- Improve the learning curve on the use of IMP/IMS for both the Government program/project office and for industry.
- Facilitate the development of well-defined and complete plans and schedules for use in day-to-day program execution, thereby decreasing risk and increasing the probability of program success.

This pamphlet is not intended as the only source of help in providing IMP and IMS, or in preparing the IMP/IMS guidance in a Request for Proposal (RFP). Each Government program team should contact its local acquisition support office during the early stages of program planning for assistance in IMP/IMS preparation. During a competitive procurement, offerors desiring Government assistance may need to forward any requests through the specific agency's contracting authority. Reference documents are identified in Appendix D.

Comments, suggestions, or questions on this document should be addressed to HQ AFMC/XRQ, 4375 Chidlaw Rd, Wright-Patterson AFB OH 45433-5006 or emailed to <mailto:Stephen.Clark@wpafb.af.mil>.

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1. Introduction

1.1. Scope.

This pamphlet provides guidance on the use of the Integrated Master Plan (IMP) and the Integrated Master Schedule (IMS) in the planning and scheduling of acquisition program work efforts. This pamphlet is for guidance only and cannot be cited as a requirement.

1.2. Objectives.

The Integrated Master Plan (IMP) and Integrated Master Schedule (IMS) are important tools that provide significant assistance in the planning and scheduling of work efforts. This IMP/IMS pamphlet outlines an approach to support program and project teams in the development of effective integrated execution plans and schedules for weapons systems and subsystems and component acquisition, modification, and sustainment. It also provides a common philosophy and methodology for developing an IMP and IMS. It describes a powerful toolset which helps meet the Air Force acquisition community's objective of delivering high-quality, best-value products and capabilities that meet the user's needs and effectively accommodate capabilities growth in subsequent evolutionary developments. This systems approach also supports the SAF/AQ goal of establishing and managing the mutual expectations of the acquisition and user communities for a program throughout its life cycle. The pamphlet also provides the benefit of AFMC experience across numerous programs/projects, and, through that experience, seeks to reduce confusion, remove "barriers" to the building of an effective IMP/IMS, and to encourage the most efficient use of resources during program planning.

1.3. Uses of the pamphlet.

This pamphlet:

- Defines and describes the concept of the IMP and IMS
- Describes various applications of an IMP/IMS
- Provides guidance on the development and implementation of the IMP/IMS
- Discusses the importance of tailoring this guidance in Requests for Proposals (RFPs)
- Discusses how the IMP and IMS can be used for program execution
- Provides a framework and examples for the IMP/IMS

1.4. Contractor-executed programs.

For contractor-executed programs, the pamphlet:

- Provides the Government team flexibility for tailoring its RFP IMP/IMS guidance to the individual program's specific requirements and characteristics.
- Emphasizes that proposal development and execution should be based on the use of the tools and processes the offeror plans to use to execute the program, even though the proposal itself may require a specific format (for example, Microsoft Project).
- Emphasizes that the Work Breakdown Structure (WBS) the offeror proposes, which is linked to the tasks within the IMS, should reflect the WBS the offeror will actually use to execute the program. The Government should not dictate the program WBS.

1.5. Examples.

In line with the principle that a picture is worth a thousand words, the pamphlet provides numerous examples of IMP/IMS “parts” and/or RFP components. Some are provided in the chapters, and others are found in the Appendices. Most are what we believe to be positive examples; however, some negative examples have been included to illustrate key points.

2. General Requirements.

2.1. IMP/IMS overview.

2.1.1. IMP overview.

The IMP is an event-based plan consisting of a hierarchy of program events, with each event being supported by specific accomplishments, and each accomplishment associated with specific criteria to be satisfied for its completion. The IMP should provide sufficient definition to track the step-by-step completion of the required accomplishments for each event and to demonstrate satisfaction of the completion criteria for each accomplishment. In the IMP the events are not tied to calendar dates; each event is completed when its supporting accomplishments are completed and when this is evidenced by the satisfaction of the criteria supporting each of those accomplishments. This plan, the IMP, is placed on contract and becomes the baseline execution plan for the program/project. Although fairly detailed, the IMP is a relatively top-level document in comparison with the IMS (see [Figure 1.](#)).

2.1.2. IMS overview.

The IMS flows directly from the IMP and supplements it with additional levels of detail. It incorporates all of the IMP’s events, accomplishments, and criteria; to these activities it adds the detailed tasks necessary to support the IMP criteria along with each task’s duration and its relationships with other tasks. This network of integrated tasks, when tied to the start date (for example, contract award), creates the task and calendar-based schedule that is the IMS. The IMS should be defined to the level of detail necessary for day-to-day execution of the program/project. The IMS should not be placed on contract.

2.1.3. IMP/IMS linkage.

The IMS is directly traceable back to the IMP and, where applicable, should also be linked to the program contractor’s Work Breakdown Structure (WBS), Statement of Work (SOW), and Earned Value Management System (EVMS). In this case, both the IMP and the IMS should be consistent with the contractor’s management and scheduling system structure and format. In general, the IMP can be thought of as the top-down planning tool and the IMS as the bottom-up execution tool for those plans. It should be noted, however, the IMS is a scheduling tool that is for execution purposes, not for cost collection purposes. Therefore, the contractor’s EVMS will contain items within its schedule tracking system, which would not appear in the IMS. Additionally, within the EVMS credit can be taken for cost purposes of items scheduled that haven’t been completed due to the multitude of options available for collecting cost credit, i.e., 100% completion of work packages when they are opened. Within the true IMS system, until an item is complete, it isn’t reported as complete. Consequently, the linkage must be present, but there shouldn’t be a misunderstanding of the subtle differences between the cost collection purposes and the management control of program progression, which is the purpose of the IMS.

2.1.4. IMP and IMS applications.

The primary purpose of the IMP and its supporting detailed schedule, the IMS, is their use by the contractor and/or the Government as the day-to-day tools for executing the program and tracking its program technical and schedule status, including all significant risk mitigation efforts. The emphasis on systems engineering by the Office of the Undersecretary of Defense (USD) for Acquisition, Technology, and Logistics and SAF/AQ (See Appendix D) is supported by incorporating activities to demonstrate selected performance indicators (e.g., Key Performance Parameters (KPP) or Technical Performance Measures (TPM)) into the IMP/IMS for enhanced visibility, progress tracking, early detection of problems, and prompt development of appropriate remedial action plans. **Paragraph 2.2.2.3.3.** describes the manner in which major performance measures should be addressed in the IMP/IMS. In summary, the IMP and IMS provide an effective method for evaluating the maturity of the program at any point.

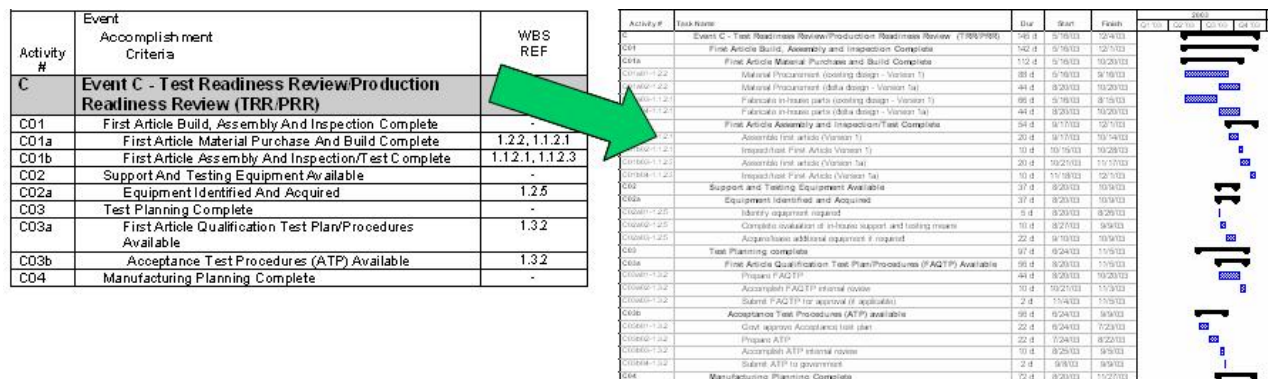
2.1.4.1. Other uses for IMP/IMS.

A well prepared IMP and IMS are tools with a wide range of value-added management applications. Paragraph **2.5.** addresses several additional applications of the IMP/IMS during various phases of the acquisition life cycle. For example, at the macro level, they can be used for top-level road mapping and as a means of supporting SAF/AQ policy (See Appendix D) on reaching mutual agreement on program expectations with the operational community. The IMP and IMS are also used by the Government in both competitive source selections and sole source negotiations. Because the proposed IMP and IMS represent the offeror's detailed plan for execution of the program, they enable the Government to effectively evaluate the offeror's understanding of the program requirements and the soundness of the proposed approach. Paragraph **3.2.2.6.** addresses the use of the IMP/IMS in performing contractor performance assessments, assessing the contractor's award or incentive fee performance, and in providing inputs to the contractor's Earned Value Management System (EVMS).

2.1.4.2. Tools for program planning and management.

Whatever the application, the IMP and IMS should clearly demonstrate that the program is structured to be executable within schedule and cost constraints, and with acceptable risk. Thus, both the IMP and IMS are key ingredients in program planning, proposal preparation, source selection, sole source negotiation, and program execution.

Figure 1. IMP and IMS Relationship.



Integrated Master Plan (IMP)

- **Event-based plan**
- **Contractual document**
- **Relatively top level**

Integrated Master Schedule (IMS)

- **Task and calendar based schedule**
- **Not a contractual document**
- **Level of detail necessary for day-to-day execution**

2.1.5. Need for the IMP/IMS.

The Integrated Master Plan (IMP) and Integrated Master Schedule (IMS) are smart business tools that enhance the management of acquisition, modification, and sustainment programs. They provide a systematic approach to program planning, scheduling, and execution. They are equally applicable to competitive and sole source procurements with industry, as well as Government-only in-house efforts. They provide a tool for improved day-to-day program execution and for on-going insight into program status by both Government program office personnel and contractor personnel. They help develop and support program/project budgeting, to perform “what-if” exercises, and to identify and assess candidate problem workarounds. And, finally, the use of the IMP/IMS focuses and strengthens the Government/contractor team.

2.1.6. IMP/IMS benefits.

Some of the primary benefits of using the IMP/IMS are addressed in **2.1.6.1.** through **2.1.6.4.** below.

2.1.6.1. Program planning and approval.

- During program planning, the Government creates an IMP/IMS. It is a very top-level form of the IMP/IMS, which can quickly convey the program “big picture” in the Government’s program planning and approval process. This “roadmap” benefit is further described in **Paragraph 2.5.2.1.**

- This initial roadmap, along with other program documentation, should provide the basis for an initial set of expectations for the program with the operational customer. As the program progresses through its development, test, production, fielding, and long-term support, this

roadmap, supported by the contractor's more detailed IMP/IMS, should reflect the satisfaction of those expectations and should also highlight areas where the expectations are not being met.

2.1.6.2. Request for Proposal, proposal preparation and source selection.

- During proposal preparation, the IMP/IMS gives offerors flexibility in performing detailed program execution planning, organization, and scheduling within any existing Request for Proposal (RFP) constraints.

- When the contractor responds to the RFP in the proposal, the IMP/IMS should be *their* more detailed roadmap of how the contractor intends to meet the RFP requirements.

- For both the Government and the offeror, the IMP/IMS methodology encourages the use of real integrated product development and systems integration approaches. All necessary functional disciplines should be contributing at this time and the offeror's IMS product should contain the integrated network formed by all the necessary tasks and their inter-relationships.

- The IMP and IMS provide the Government evaluation team with the information needed to assess each offeror's approach against the RFP's requirements including Mission Capability, Proposal Risk, Performance Confidence, and Price/Cost evaluation factors. The IMP and IMS should accurately represent the offeror's proposed program approach, which should be executable within the cost/schedule/risk constraints.

2.1.6.3. Contract award.

- Normally there will be some form of a Post Award Conference shortly after contract award. At this time the program/project office and the contractor team will meet to discuss the program, the Government and contractor's plans and schedule, and any issues that need to be addressed. This activity serves as the basis for ensuring that there is mutual understanding and agreement on the program content, the program plan, the schedule, and risk. The integrated plan and schedule play a major role in reaching that understanding and agreement.

- The IMP becomes contractual while the IMS is the contractor's tool for day-to-day program execution. Together they provide the detailed integrated execution plan and supporting schedule. They identify what has to be done and when it must be done.

2.1.6.4. Program execution.

- During actual program execution, the IMP/IMS provide a framework for insight into the contractor's performance for both the program/project office and for the contractor's management team. The IMP/IMS enables the program/project office to:

- Identify and assess actual progress versus the planned progress
- Monitor the program critical path and help develop workarounds to problem areas
- Assess program maturity
- Assess the status of risk management activities based on the inclusion of the program risk mitigation activities in the IMP/IMS
- Assess the progress on selected TPMs and KPPs
- Provide an objective, quantitative basis for the Contractor Performance Assessment Rating (CPAR) and/or Award Fee

- As the program matures, the roadmap will also mature and provide better insight into potential follow-on efforts that were not part of the original contract award. For example, the contractor should be able to more clearly define the activities, new interfaces, and other clarifying information necessary to award a contract for a planned evolutionary cycle or contract option.

2.1.6.5. The use of standard verbs in the IMP/IMS.

The language used in every IMP/IMS can make these planning and schedule documents dramatically clearer by adopting a very simple expedient: standardizing the use of verbs in the IMP/IMS. This requires following two simple practices. First, the IMP activities (events, accomplishments, and criteria) should all be structured using past tense verbs. Second, the IMS activities (tasks) should be structured using present tense verbs. Similarly, because the IMS tasks state what the team is going to do, the clearest and most accurate language to use is present tense verbs (Develop Specification, Perform Requirements Analysis). Because IMP activities designate assessment points associated only with completed efforts, the clearest and most accurate language to use for IMP activities is past tense verbs (PDR Completed; Requirements Analysis Completed). Once a set of sequential tasks (constituting a work package) is finished, this validates that the criterion has been satisfied. The change in verb tense assures that the relationship between IMS tasks and IMP activities is always clear. Using standard verb structures consistently emphasizes these important distinctions. In doing so it immensely simplifies the thinking that goes into the development of the IMP/IMS, makes the development process more fail-safe, and provides a very simple marker system that ensures continuous clarity. An example follows:

Activity Number	Activities			
	IMP Event			
		IMP Accomplishment		
			IMP Criteria	
				IMS Task
A	PDR <u>Completed</u>			
A01		Requirements Analysis <u>Completed</u>		
A01a			Avionics Requirements Analysis <u>Completed</u>	
A01a01				<u>Perform</u> Avionics Requirements Analysis
A01a02				<u>Develop</u> Avionics Draft Specification
A01a03				<u>Coordinate</u> Avionics Draft Specification for Review
A01a03				<u>Finalize</u> and <u>Publish</u> Avionics Specification.

2.2. Integrated Master Plan general description.

2.2.1. Integrated Master Plan.

The IMP is an event-driven program/project plan that provides top-level control and progress management through establishment of key events and associated accomplishments and criteria for each accomplishment. Unlike the IMS, the IMP is contractual.

2.2.1.1. IMP applications.

The IMP is the plan for executing the program and represents the sequential structure of the program activities. It is an effective tool for both Government and contractor management to plan work and assess progress. It can be used to accomplish up front planning and verify commitment, help minimize risk, measure program maturity, and provide management with incremental verification of program progress to support informed program decisions.

2.2.1.2. Hierarchy of activities.

The IMP represents the program architecture and contains a hierarchy of the program execution activities. Specifically this hierarchy contains the:

- “Events” which are laid out sequentially
- “Accomplishments” that support each event
- Criteria” that substantiate each accomplishment’s completion

2.2.1.3. The structure of the IMP.

Although the IMP itself is not tied to the calendar, it forms the basis for the IMS, which contains supporting tasks and their durations, providing a calendar-based schedule. The IMP, as a contractual document, should not be so large to become burdensome, potentially requiring frequent contract changes. It does, however, normally contain:

- An introduction
- A hierarchy of events, accomplishments, and criteria
- Optional narratives describing critical processes and/or level of effort tasks
- A glossary of terms

2.2.2. Events, accomplishments, and criteria.

The events, accomplishments, and criteria sections of the IMP provide a mechanism for planning and evaluating the successful completion of the identified efforts. The IMP should include all the activities and elements associated with development, production, and/or modification and delivery of the total product including tooling, modification kits, test, support equipment, logistics support, technical manuals, and training requirements.

2.2.2.1. Event.

An event is a program assessment point, which occurs at the culmination of significant program activities. Examples of significant program activities might include a Preliminary Design Review or a Critical Design Review.

2.2.2.1.1. Foundation of the IMP.

Events are the foundation of the Integrated Master Plan. They represent logical points at which to assess the program’s progress. IMP events should be sequenced in a logical order. They may include program design reviews, tests, deliveries, and other key progress demonstration or risk mitigation points. The program/project office may identify a minimum set of required events. These will be provided in the RFP for contractor-executed programs. (see [3.1.3.](#)) The offerors incorporate these events, as well as any additional events

or alternative events based on their proposed execution approach in their proposed IMP. For a Government-executed program, the Government team will expand as necessary on the minimum set of required events. For each event, there will normally be two or more accomplishments. Completion of all of these supporting accomplishments constitutes completion of the event.

2.2.2.1.2. Events versus milestones.

The term “milestone” is frequently used within the DoD community, and can lead to confusion as to the difference between an “event” and a “milestone.” To avoid confusion, the only time the term “milestone” is used within this IMP/IMS pamphlet is when it specifically refers to a DoD milestone, such as DoD Milestone A. This is not to preclude a DoD milestone being selected as an event.

2.2.2.1.3. Event selection.

Care should be exercised in selecting the number and level of events we include in the Execution IMP because it becomes a contractual document requiring a contract change to modify. One major program recently removed the IMP from contract and discarded the IMS data item entirely because it had become too burdensome and costly to manage. It turned out that the original Execution IMP placed an extremely large number of events on contract. As the System Program Office (SPO) was reduced in size, the IMP and IMS became unmanageable, and the SPO was forced to create a new tool that focused on remaining critical events. The IMP and IMS should not become so burdensome and costly to manage that they become non-value added. An extremely large number of events on contract could become unmanageable. The focus should be on key or critical items that need to be contractually supported.

2.2.2.2. Accomplishment.

An accomplishment is an interim activity, which must be completed, in a logical sequence to satisfy the requirements for successfully completing an event.

2.2.2.2.1. Government-determined accomplishments

As with events, the Government may determine a minimum set of required accomplishments. For each accomplishment, there will normally be two or more supporting criteria. Completion of all of the supporting criteria constitutes completion of the accomplishment. Examples of accomplishments might include “Delivery 1,” “application modules complete,” or “commercial and applications software integrated.”

2.2.2.3. Criteria.

Criteria are measurable indicators, which provide definitive evidence that a specific accomplishment has been completed.

2.2.2.3.1. Examples.

Criteria may include but are not limited to:

- Completed work efforts (for example, All Identified Trade Studies Complete or Manufacturing Plan Complete).

- Activities to confirm success of meeting technical, schedule, or cost parameters (for example, Flight Test Report Approved).
- Internal documents which provide results of incremental verification of a TPM or risk mitigation activity (for example, Wind Tunnel Test Data Analysis Complete).
- Completion of critical process activities and products required by the offeror's internal program plans or operating instructions (for example, Risk Management Plan Approved).

2.2.2.3.2. Quantitative versus qualitative.

Criteria can be either quantitative or qualitative, and must be measurable. For example, "Test plan completed and approved" is a measurable criterion, as well as "Four tests sets delivered." Conversely, "Test plan 85% complete" is difficult to assess, if at all, because the last 15 percent may include hard-to-do elements that require more effort than the first 85 percent.

2.2.2.3.3. Use of specific values in criteria.

Values of specification requirements, technical performance measures (TPMs), and metrics are not normally used in IMP criteria. However, it is appropriate to have a reference to critical measures in the criteria of the IMP (for example, airspeed Key Performance Parameters (KPPs) demonstrated, or radar resolution TPM). The completion of internal contractor modeling, simulation, or analysis activities and associated reports used to estimate the value of a critical technical parameter might also be included as criteria.

2.2.2.3.4. Event driven.

In some cases in the past, significant resources have been wasted by proceeding into a formal review, demonstration or flight test before the contractor or Government team is ready, simply because the "scheduled date" occurs. This is prompted by a "schedule driven" philosophy. Keep in mind that the IMP is not schedule driven but event-driven and that the event will occur based on the completion of its supporting accomplishments and the criteria supporting those accomplishments.

2.2.2.3.5. Use of entry and exit criteria.

To avoid the type of problem described above, it might be appropriate to think of criteria as "entry" or "exit" criteria supporting those accomplishments, which in turn are supporting resource-intensive events, like a major review or a flight test. Entry criteria reflect what must be done to be ready to initiate a review, demonstration, or test. Exit criteria reflect what must be done to "know" that the event has been successfully completed. As noted, this entry/exit criteria case primarily applies to resource intensive events; other events would not normally use them. Examples of entry and exit criteria are provided in [3.1.4.5](#).

2.2.3. IMP narratives.

The IMP may contain a narrative section which gives the offerors an opportunity to provide additional insight into their total work effort and to address how their organization will develop and implement, the critical processes they will use in executing the IMP to achieve all program goals. Any important activities or outputs related to these processes (for example, the Functional Config-

uration Audit (FCA)/Physical Configuration Audit (PCA)) should also be reflected in the IMP. As a whole, the IMP will represent an Integrated Product and Process Development (IPPD) approach that encompasses all deliverable products (including hardware, software, and technical data) and the functional disciplines that support the creation and sustainment of those products (including engineering, test, manufacturing, logistics, and program management).

2.2.3.1. Types of IMP Narratives.

Narratives can be used to provide additional information to further the understanding of the execution plan. While there is no constraint on the types of information that can be included in the IMP narratives, they should not be used to cover material that properly belongs in the Technical/Management Volume of the proposal. The most common narrative types are described as follows:

- A process narratives may be used to facilitate contractor commitment to the use of critical processes and procedures and Government understanding of the proposed critical processes/procedures prior to contract award. These process narratives would consist of concise summaries providing visibility into key management and functional processes/procedures, how they relate to the integrated product development process, and an overview of the efforts required to implement them. For example, the Government might want an explanation of the offeror's systems engineering, risk management or software development processes.

- Task Narratives may be used to describe the approach to executing those tasks for which there may be no specific IMP accomplishments. For example, the Government might want more insight into how level-of-effort tasks such as configuration management or program control supporting the overall program will be accomplished.

2.2.3.2. Use of Narratives.

There has been a great deal of discussion as to whether process narratives should be included in the IMP. Some Air Force Materiel Command (AFMC) Centers discourage their use, while others prefer to include them. Rather than recommend or try to impose an answer, this pamphlet provides the following "Pros" and "Cons" on the use of process narratives:

Pros

- Provides additional insight into the critical processes to be used in executing the program
- Provides contractual commitment to the use of the processes in contractor-executed programs.

Cons

- Can significantly increase the size of the IMP
- As IMP is contractual, change in contractor's processes may necessitate a contract change, which:
 - Decreases the contractor's flexibility to make internal process changes
 - Inhibits continual process improvement

2.2.4. The way the IMP works.

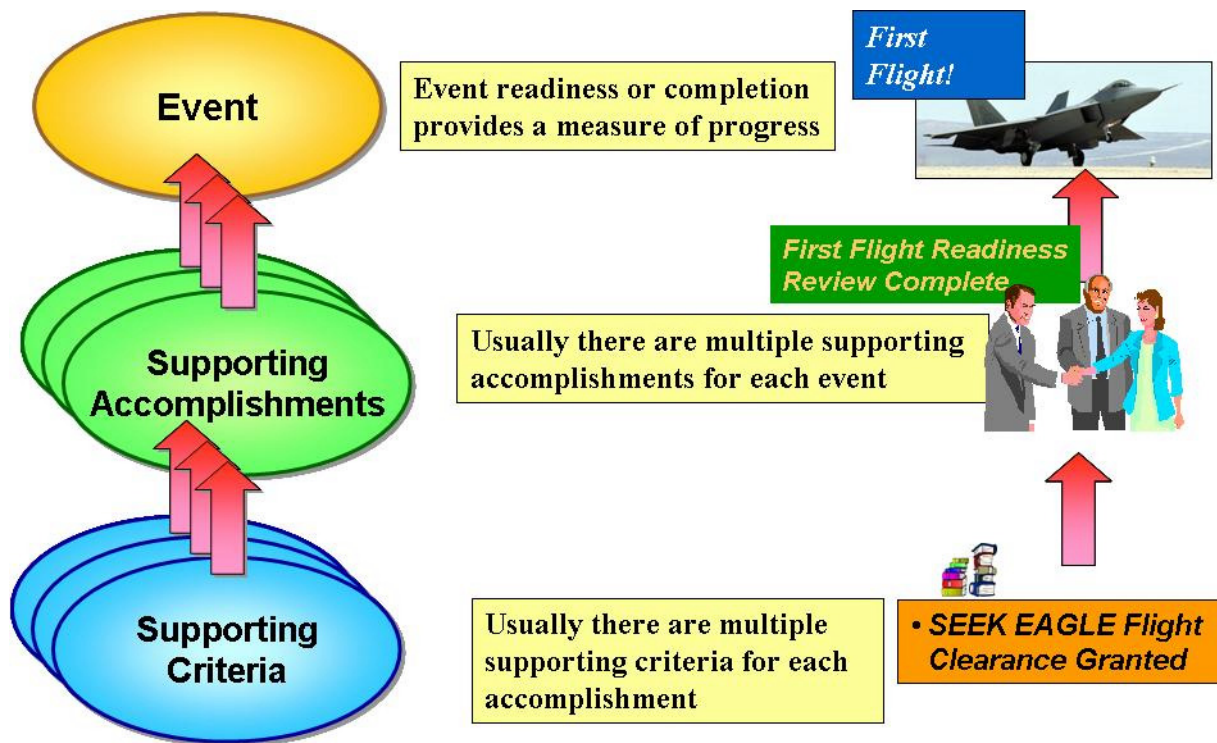
To illustrate how the IMP concept works, the example below uses a single event, along with only one of several supporting accomplishments, and only one of several supporting criteria for that accomplishment. The event, accomplishment, and criterion respectively are:

- First flight of a new aircraft completed.
 - First Flight Readiness Review completed.
 - SEEK EAGLE flight clearance (for carrying external stores) granted.

2.2.4.1. Example.

In this example (see [Figure 2.](#)), when the SEEK EAGLE flight clearance is granted, that criterion is satisfied. When this criterion is satisfied (along with satisfaction of all the other “entry” criteria that would support holding a First Flight Readiness Review) the review can then be held. When the review is held and satisfies its “exit” criteria, then the First Flight Readiness Review accomplishment supporting the First Flight is complete. When all the other accomplishments (for example, actually conducting the First Flight) that would normally support a first flight are complete, then the First Flight event is complete.

Figure 2. The Way the IMP Works.



2.3. Integrated Master Schedule general description.

2.3.1. Integrated Master Schedule (IMS) definitions.

The definitions in this section should be used when preparing either a proposal or an execution IMS. These terms also accompany IMS execution reporting requirements through the Data Item Description (DID) DI-MISC-81183, *Integrated Master Schedule (IMS)*.

2.3.1.1. Integrated Master Schedule definition.

The IMS is an integrated, master schedule containing the networked, detailed tasks necessary to support the events, accomplishments, and criteria of the IMP. The execution IMS shall contain all of the contract IMP events, accomplishments, and criteria from contract award to completion of the contract. The IMS shall be a logical network-based schedule that is directly traceable to the contractor's cost/schedule reporting instrument used to address variances (such as Cost Performance Report (CPR), Cost/Schedule Status Report (C/SSR), etc.).

2.3.1.2. Task definition.

A task is a time-phased, detailed activity (where work is accomplished and funds are expended) required to support the IMP criteria and accomplishments.

2.3.1.3. Critical path definition.

The critical path is the sequence of activities (tasks) in the network that has the longest total duration through the program/project.

2.3.1.4. Periodic analysis.

A periodic analysis is a written analysis of the program execution status. The level of detail and frequency of reporting will be defined in the DD Form 1423, **Contract Data Requirements List (CDRL)**.

2.3.2. IMS description.

The following paragraph provides a basic description of the IMS.

2.3.2.1. Integration with IMP.

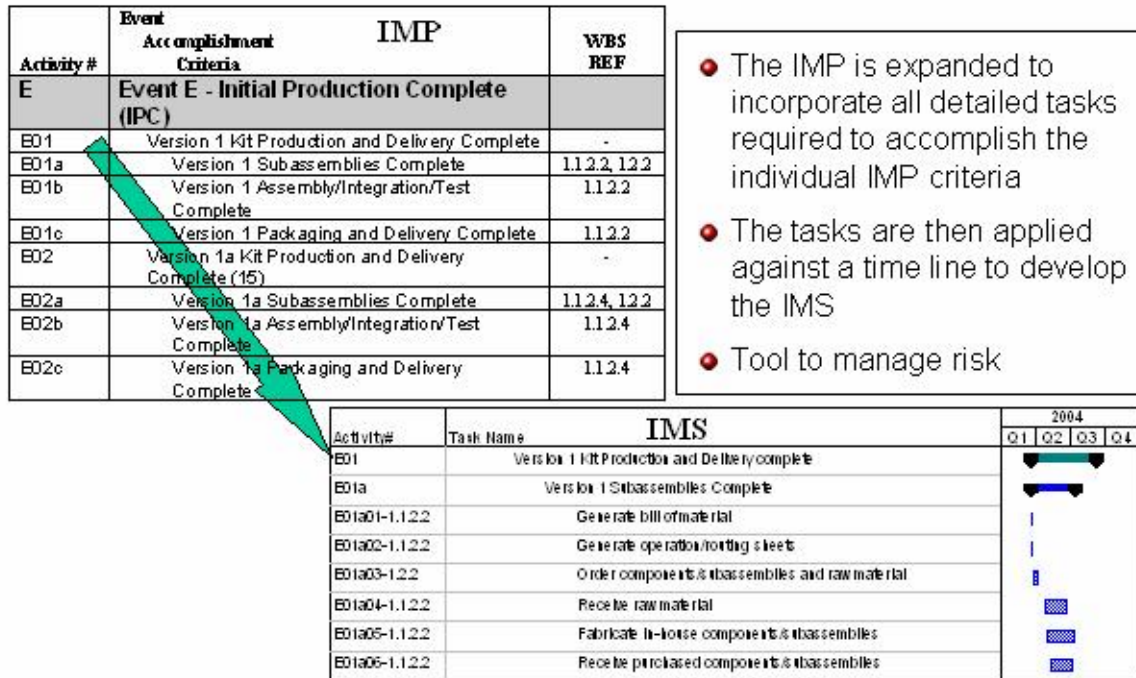
The IMS is an integrated, networked schedule containing all the detailed tasks necessary to support the events, accomplishments, and criteria of the IMP. The IMP events, accomplishments, and criteria are transferred into the IMS, and the criteria are then expanded by adding the detailed tasks necessary to complete each criterion (see [Figure 3.](#)). As a result, the IMS should include all the activities and elements associated with development, production, and/or modification and delivery of the total product and be directly traceable to the IMP. Durations are entered for each task, along with predecessor/successor relationships, and any constraints that control the start or finish of each task. It should be noted that although durations are only assigned at the task level, these durations will roll up to show the overall duration of any event, accomplishment, or criterion. The result is a fully networked schedule that includes a critical path. The result is a fully networked schedule capable of critical path analysis. Activities along the critical path define the sequence of discrete tasks in the network that have the longest total duration through the schedule. Therefore, when any critical path task slips, the program completion date slips.

2.3.2.2. Linkage to calendar.

The IMS is calendar-based through the start date (for example, Contract Award for a contracted effort), the task durations, and task relationships. It becomes the source that depicts the planned dates when all events are expected to occur, as well as all the expected dates for all necessary work to be done to get to the event. [Figure 3.](#) provides an example of these interrelationships. As the IMS captures all the events, accomplishments, and criteria of the IMP

along with the supporting tasks and their relationships, it becomes the detailed schedule for day-to-day execution of the program/project and, thereby, an effective tool for management of the program and insight into the progress of the effort. It is used for identification of problem areas during program planning and execution, and to help define priorities for management attention and action, particularly as problem areas are identified. Because actual progress can be compared to the planned progress, the IMS is key to providing performance measurement and evaluating remaining work scope and duration.

Figure 3. IMP Expanded to IMS.



2.3.2.3. Automated tools.

The IMS is normally created using an automated scheduling tool and the hard copy is often provided in the form of Gantt charts (as depicted in **Figure 3.**). The automated tool most commonly used by the Air Force and the other services is Microsoft Project. Therefore, many of the examples in this pamphlet are either generated by or geared to Microsoft Project. However, the principles and philosophy of these examples should apply to any other proposed automated scheduling tool which may be used in the execution of the program.

2.3.2.4. Scheduling tool selection.

The automated scheduling tool used for the IMS should be useable and understandable for both the Government and contractor personnel, both for proposal evaluation and program execution.

2.3.3. How the IMS works.

The same event, supporting accomplishment, and criterion example used in paragraph 2.2.4., illustrate how the IMS works. With the addition of four specific tasks that support satisfaction of the criterion from paragraph 2.2.4.

1. First Flight Complete

- a. First Flight Readiness Review Complete

- (1) SEEK EAGLE Flight Clearance Granted (for carrying external stores)

- (a.) Perform Safety of Flight (SOF) analyses and tests
 - (b.) Prepare and submit SEEK EAGLE Certification Data
 - (c.) Validate software and hardware interfaces in the System Integration Lab (SIL)
 - (d.) Provide SEEK EAGLE Office interim flight clearance

- 2.3.3.1. IMS example.

In this example (see Figure 4.), when the four specific tasks are successfully completed, the SEEK EAGLE flight clearance is granted. As in the example in 2.2.4., the criterion then supports the Flight Readiness Review, and the successful completion of that review supports the First Flight event. As cited earlier, the actual IMP and its IMS would have multiple accomplishments supporting the First Flight event with each event supported by multiple criteria and each criterion supported by multiple tasks.

- 2.3.3.2. Work package.

A work package is a set of stand-alone sequential IMS tasks (the last of which is a product), which collectively validate the completion of an IMP Criterion. The significance of the work package is that, once defined, the tasks can be scheduled, manloaded, and easily used by estimators as the basis of a cost estimate that is realistic, justifiable, and directly traceable to the work to be performed. (It is easy to see why this is one of the most important and far-reaching benefits associated with the development of the IMS.) The roll up of the work package cost estimates then translate to the program cost estimate. Therefore, the offeror should of course use the same detailed tasks for both the IMS and the “basis of estimate” (BOE) in the cost volume as noted in paragraph 5.1.3.2.3. Once the program is awarded, the work packages form the basis for the contractor’s EVMS.

In Figure 4., the four tasks supporting the criterion “SEEK EAGLE Flight Clearance Granted” constitute a stand-alone individual work package.

Figure 4. The Way the IMS Works.



2.4. Single numbering system and traceability to WBS.

A single numbering system in the automated IMS tool makes it possible to link IMP activities and IMS tasks in a networked environment so that interdependencies are automatically tracked.

2.4.1. Linkage.

To establish the relationships between the events, accomplishments, and criteria defined in the IMP and the tasks broken out in the IMS, a logical and traceable numbering system is applied to all elements by assigning each a unique activity number. [Table 1.](#) provides a generic example of a single numbering system. The activity number for the circled task would be D01a02; each activity number is unique to a specific task. It should be noted that the alphanumeric scheme cited here is an example. Other schemes may be used.

Table 1. Single Numbering System.

Event	Accomplishment	Criteria	Task
C	01	a	01
			02
		b	01
			02
	02	a	01
			02
		b	01
		c	01
D	01	a	01
			02

2.4.2. Single Numbering Example.

This single numbering system is further illustrated by the specific example seen in [Table 2](#). For this example, Event D is “First Flight Completed” and the first accomplishment is “First Flight Readiness Review Completed.” The first criterion for this first accomplishment is “Test Planning Completed” and the first two supporting IMS tasks are “Prepare flight test plans and procedures” and “Submit flight test plans and procedures.” In this case we would number the IMP/IMS elements as shown in [Table 2](#).

Table 2. IMP/IMS Single Numbering System Example.

	Activity #	
Event	D	First Flight Complete
Accomplishment	D01	First Flight Readiness Review Complete
Criterion	D01a	Test Planning Complete
First Task	D01a01	Prepare flight test plans and procedures
Second Task	D01a02	Submit flight test plans and procedures

2.4.3. Traceability to WBS.

The IMP and IMS should provide traceability to the contractor’s WBS. This can be done by including the applicable WBS element in a separate text field at the IMS task level, where the work is actually accomplished and funds expended. The relationship of events, accomplishments, and criteria to the WBS can be determined by a roll-up of their subordinate task relationships. Therefore it is important to add a WBS reference column to the IMP Events, Accomplishments, and Criteria Table. This makes it possible to show all the WBS elements related to each criterion in the IMP by performing a roll-up of each criterion’s supporting tasks from the IMS. In our exam-

ple, the assumption is that the tasks under the criterion “Approved Test Procedures Available” come under WBS 67000 (System Test & Evaluation) for preparation and under WBS 64000 (Data Management) for submittal. The roll-up is illustrated in [Table 3](#), with criterion D01a supporting WBS elements 67000 and 64000. This traceability to the WBS also provides an important link between the IMS and the contractor’s EVMS.

Table 3. IMP Events, Accomplishments and Criteria.

Activity #	Event	WBS REF
	Accomplishment Criteria	
D	First Flight Complete	-
D01	First Flight Readiness Review Complete	-
D01a	Approved Test Procedures Available	67000, 64000

2.5. Application.

2.5.1. General application.

The IMP/IMS tool is applicable to any program/project, in any phase of an acquisition, modification, or sustainment effort from initial program/project office planning to contract closeout for contracted programs, or from initial planning to completion for Government-only in-house programs. Use of the tool is independent of the program/project’s complexity, size, or cost. These factors may, however, affect the required level of detail and the amount of tailoring required.

2.5.2. Specific applications.

The IMP and IMS are management planning and execution and progress tracking tools that provide program/project insight, top-level control, and progress management of the detailed tasks necessary to support the program’s events, accomplishments, and criteria. They can be applied in numerous situations. This Pamphlet addresses three specific applications:

- An over-arching Government Roadmap IMP/IMS
- A Pre-Award IMP/IMS,
- An Execution IMP/IMS

2.5.2.1. Government Roadmap IMP/IMS.

This is a highly tailored form of the IMP/IMS that is used to create a relatively top level Government Roadmap for a program. This Roadmap should:

- Be prepared by the Government program office early in the program-planning phase in conjunction with any other supporting or associated Government program offices.
- Focus on and convey the “big picture” of the program objectives, capabilities evolution, summary schedule, and any major program constraints. This Roadmap can be used to orient others; for example, HQ USAF, DoD, Industry, and Congress. As stated earlier, it also directly supports reaching a mutual agreement on program expectations with the operational community, and supports ongoing assessments of compliance with expectations for the program.

- Support initial and subsequent budget submissions, and provide the basis for developing a sound defense against, or an ability to, funding cuts or increases throughout the program life.
- Contain key events and show critical schedule interfaces with all supporting programs/activities (for example, the Services, DARPA, other agencies) and their supporting contracts.
- Be reviewed regularly by your program office and supporting program offices to assess progress toward accomplishing key event and schedule interfaces. The Roadmap should be updated as necessary.
- Help detect disconnects early, and thus provide lead-time and a planning tool to help address them.

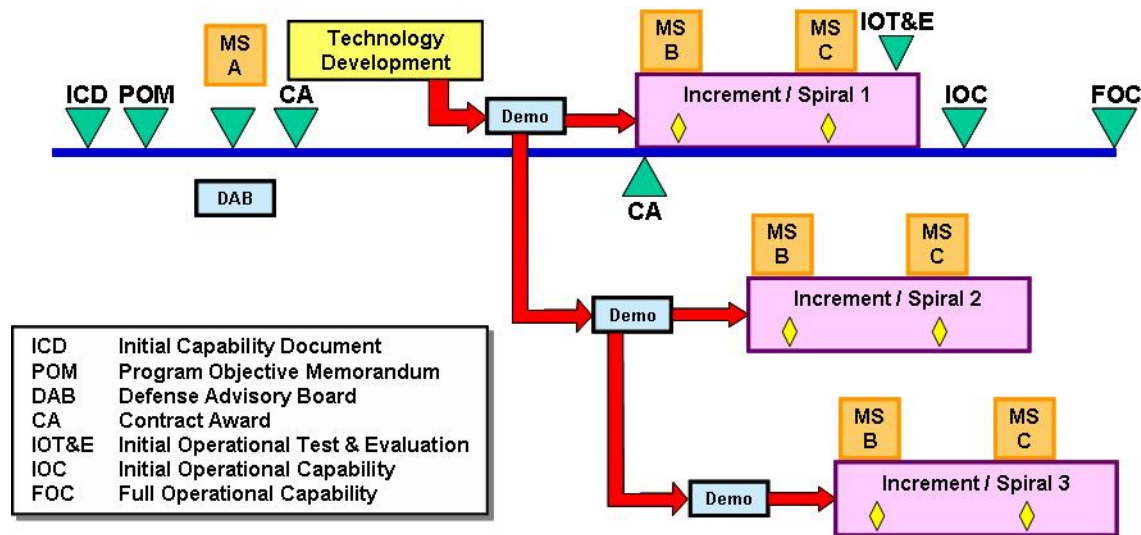
2.5.2.1.1. Government Roadmap purpose.

The Government Roadmap IMP/IMS should integrate and capture the unique and challenging aspects of the program and should serve as the Government's overarching planning and management tool for monitoring progress toward the accomplishment of overall program goals and objectives. This Roadmap is particularly critical and useful for programs containing, or interfacing with, multi-Government agencies, activities and/or the integration of multiple contracts. The Roadmap should be shared with all Government agencies outside the program/project office that might be involved with the program in order to obtain their inputs as to its adequacy, accuracy, and feasibility. The Roadmap also becomes the framework for the program and IMP/IMS guidelines included in an RFP. Therefore, it is very important to share the Roadmap as early as possible with prospective offerors and contractors. This gives them the opportunity to provide valuable feedback as to program content and schedule feasibility, as well as preparing a sound Execution IMP/IMS to support source selection or sole-source contract award.

2.5.2.1.2. Evolutionary acquisition example.

A generic, very top level Roadmap is provided in [Figure 5](#). as an example. It shows the top-level activities throughout the program from the Initial Capability Document (ICD) through to Full Operational Capability (FOC). This Roadmap IMP example and its ties to the more detailed execution IMP/IMS of the major contracted efforts supporting the program are discussed in [3.1.1.2](#).

Figure 5. Government Roadmap IMP/IMS.



2.5.2.2. Pre-award IMP/IMS.

The pre-award IMP/IMS is a document a program office can use to plan, coordinate, and track the progress of those Government and industry activities necessary to achieve contract award. Depending on the acquisition strategy and the complexity of the source determination and contracting, each program office will decide whether or not to prepare a pre-award IMP/IMS. However, it can be an extremely useful tool for planning, managing, and tracking the pre-award activities with the objective of making an on-schedule contract award.

2.5.2.2.1. Elements captured.

The Pre-Award IMP/IMS should capture:

- What needs to be done and by when in all functional disciplines to get on contract.
- Who will make it happen (for example, program office, user, acquiring location, other service, other agency).
- How it fits together to support the contract award and eventual execution.

2.5.2.2.2. Benefits.

It can help track the progress of all supporting contracting efforts, regardless of their source (for example, USAF, USN, USMC, DARPA), to support your program. This is important since managing in a multi-agency, multi-program, multi-contract environment is becoming the norm rather than the exception. The pre-award IMP/IMS can help in cases requiring integration of externally developed/managed/controlled products into the weapon system you are managing. For example, adding the next generation Joint Direct Attack Munitions (JDAM) capability, the associated mission planning capability, and the support equipment to the B-1, B-2, or B-52 weapon system.

2.5.2.3. Execution IMP/IMS.

The Execution IMP/IMS covers the detailed efforts required to successfully execute the program. It captures what needs to be done, how those activities are integrated, and how long it

will take to complete them. This application has often been referred to as the “Contract” IMP, but in reality it applies whether the program is to be executed by a contractor or the Government itself (in the case of in-house laboratory programs, Air Logistics Center (ALC)-performed modifications, etc.). In either case, the same philosophy and methodology apply to the preparation of the IMP/IMS. For contractor-executed programs, the offerors will include the proposed Execution IMP/IMS in their proposal. On a program with many contract efforts, each contract effort would have its own Execution IMP/IMS for that portion of the total program.

2.6. Contractual Relationships.

In a contractor-executed program, the proposed execution IMP is normally submitted as part of the proposal and incorporated as an attachment in Section J at contract award, becoming the mutually agreed-to “event driven” approach for program execution. Because the IMS is calendar-based and goes to a lower level of detail than the IMP, it may be subject to more frequent changes. Therefore, the IMS is normally submitted as part of the Technical Volume, and **should not be placed on contract**. Doing so could trigger a contract change every time a lower level task’s content, start date, or completion date changed. The IMS normally becomes a data item, which is regularly updated, either through the CDRL, the Data Accession List (DAL), or Electronic Data Interchange. Further discussion of the IMS as a CDRL can be found in [3.1.3.2.11.](#)

2.7. Integrated Product and Process Development (IPPD) Compatibility.

The implementation of the IMP/IMS on a program is an integral part of the IPPD framework for the work effort to be accomplished. They should be written to align with the Integrated Product Development philosophy in which the IMP/IMS sets forth the necessary activities to be performed by all functional disciplines to produce the product. The IMP and IMS clearly communicate the expectations of the program team and should provide traceability to the management and execution of the program by Integrated Product Teams (IPTs). They should also provide traceability to the Work Breakdown Structure (WBS), which defines the products and key processes associated with program accomplishment and is the basis of IPT-generated cost estimates and cost reporting.

3. IMP/IMS Development And Implementation

Examples are provided in this section to show how an IMP/IMS could be developed and implemented in different situations. Events, accomplishments, and criteria may vary depending on the program characteristics, but the overriding objective is to use these management tools and tailor them to best serve the specific program. The same principles apply whether the program is an internal Government activity, a contracted effort, or an integrated multi-contract activity. Events, accomplishments, and criteria are specifically tied to the program where it is necessary to measure or demonstrate progress before proceeding with follow-on activities.

3.1. Development of the IMP/IMS.

3.1.1. Government Roadmap IMP/IMS.

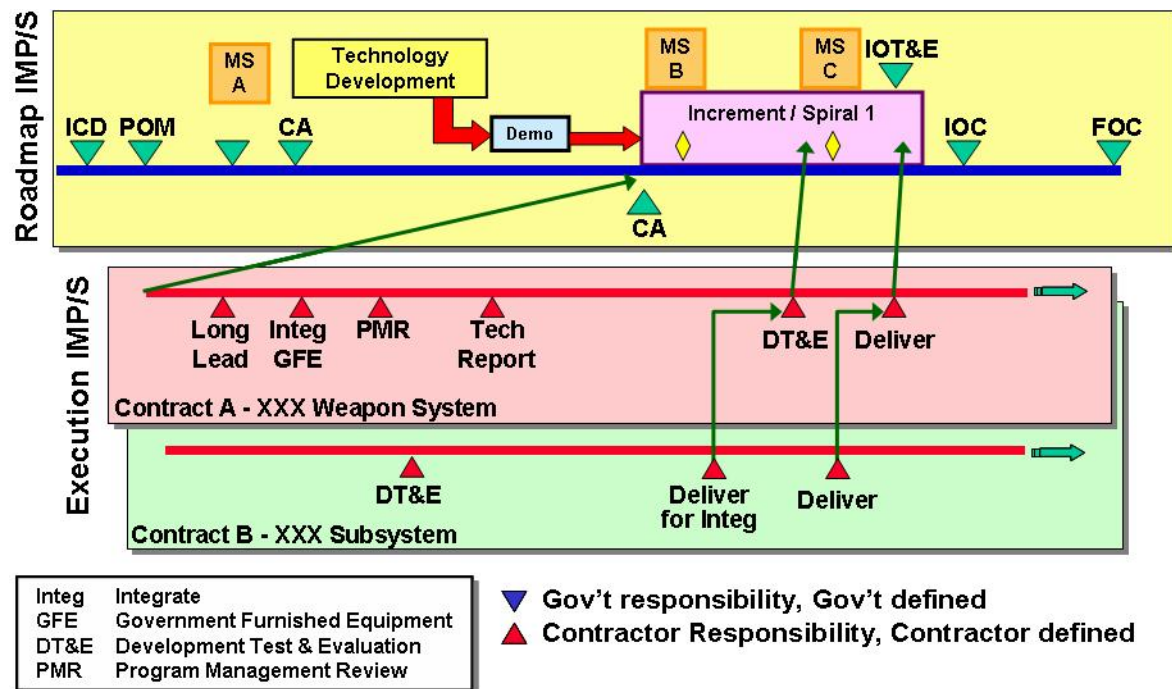
As soon as a planned program or project is identified and assigned to a program/project team, that team should start to prepare the initial Government Roadmap IMP/IMS for the overall effort. They should review all of the program components to identify individual work efforts that signify the various stages of development for the program. These should include work efforts the team controls within its own program, as well as the interfaces/interactions with programs that others con-

trol and are necessary for the success of the program (for example, a key delivery date of a Navy missile to be integrated on an Air Force aircraft). In many cases, events, interfaces, or transition points between these work efforts have already been identified as checkpoints for external reviews. Whether these reviews are at the Milestone Review with the Office of the Secretary of Defense (OSD) level or Strategic/Tactical Roundtables with a Center's functional experts, they should be the initial Government Roadmap IMP/IMS for the near term. The team then tailors the initial Roadmap IMP/IMS to the unique characteristics of the program and lays out the program to achieve consensus from all involved Government agencies. This Roadmap IMP/IMS, augmented with other program documentation, should support the establishment of the Expectation Management Agreement (EMA) between the acquisition and operational community. (See Appendix D). The Roadmap is normally kept at a fairly high level, particularly prior to contract award. As details are refined for future contracted activities, the Roadmap IMP/IMS can be updated to assure the top level critical program events, interfaces, and work activities are represented. Joint service programs may increase the total number of Government activities in this total Roadmap IMP/IMS. Many of these activities become progress assessment or demonstration points for higher headquarters and OSD. The Roadmap IMP/IMS will also show how multi-contract and multi-agency activities, such as test activities, external resources, program support, equipment acquisitions, and/or production deliveries will integrate with any directed program demonstration points. It may also reflect additional Government requirements, such as MILCON or post-production support. During the actual program execution all partners must have full access to this information to ensure that planning and scheduling remain current and reasonable.

3.1.1.1. Roadmap IMP/IMS example.

The Government Roadmap IMP/IMS is often prepared and maintained as a single product in Gantt-type format, showing critical activities and interfaces across the entire program, as well as critical dates that may be dictated by higher authority. **Figure 6.** shows one example of a high-level generic Government Roadmap IMP/IMS and high-level examples of two supporting contract execution IMP/IMS. In the example, Contract A represents the Execution IMP/IMS for the weapon system prime contract. Contract B might be a contract through another Procuring Activity within another AFMC Center or within another service to a subsystem contractor whose equipment will be integrated into the weapon system. The Roadmap IMP/IMS shows how the key events (or activities) of the Execution contracts (A and B) interface with and support each other and interface with and support the completion of the events of the overarching Roadmap IMP/IMS. The key activities shown in **Figure 6.** for Contract B to support that integration would also be reflected in the Contract A Execution IMP/IMS.

Figure 6. Government Roadmap IMP/IMS Example.



3.1.1.2. The Government Roadmap as the basis for the execution IMP/IMS.

The Government Roadmap IMP/IMS becomes the basis of each Execution IMP/IMS and should be developed as early as possible. It provides a basis for a list of critical events, which will be included in the Section L, Instruction to Offerors, of the RFP (see 3.1.3.). Early involvement of industry, as well as the user, and seeking their inputs to the Roadmap IMP/IMS is strongly recommended and will likely influence the development of the final Roadmap IMP/IMS. For competitive procurements, the Roadmap IMP/IMS can be presented at activities such as Industry Days or pre-solicitation conferences to start that involvement. The Procuring Activity should discuss schedule uncertainty and/or the impacts of critical directed dates with industry in these meetings before release of the draft RFP (DRFP) and should encourage further comment from them in response to the DRFP.

3.1.1.3. Management of Roadmap IMP.

Throughout the life of the program, additional situations and information will surface which have associated critical events, accomplishments, and criteria that should be included in the Roadmap (for example, awards of additional contract efforts). The Roadmap IMP/IMS may have to be modified to reflect these. After contract award or in a sole source environment, the Government may also decide to expand the Roadmap IMP/IMS to lower levels of detail. In that case, the same principles should be applied as to the Execution IMP/IMS. Independent of the level of detail, it is important that some form of change control be provided for the Roadmap IMP/IMS. Additionally, during the actual program execution all partners must have full access to the Roadmap to ensure that planning and scheduling remain current and reasonable.

3.1.1.4. Roadmap and Execution IMP/IMS interface.

If the Government Roadmap IMP/IMS is expanded to lower levels of detail, caution should be used in duplicating tasks in both the Roadmap IMP/IMS and the Execution IMS, since this provides more opportunity for errors and disconnects when either one is updated. To avoid this, a good rule of thumb might be to include only key products or progress points from the Execution IMP/IMS in the Roadmap IMP/IMS.

3.1.2. Pre-Award IMP/IMS.

As described earlier, a pre-award IMP/IMS can be valuable in planning and tracking the Government and industry activities necessary to reach a contract award. For this type of IMP/IMS, it may not be necessary to prepare a separate IMP and IMS. Both can be easily captured in one document or file. **Figure 7.** gives an example of a pre-award IMP/IMS. This particular example uses an Execution IMP/IMS structure, with activities that could be classified as events (for example, Contract Award), accomplishments (for example, Strategy Development Completed, RFP Development Completed), criteria (for example, Source Selection Plan Completed, Formal RFP Released) and tasks (for example, Revise DRFP, Prepare Executive Summary letter). The pre-award IMP/IMS does not necessarily have to contain all defined levels of an IMS. In some cases, it may be appropriate to assign durations at what may be the criteria level, or even an accomplishment level. The key is to tailor it to your specific application. The local acquisition support team should be able to provide help in the preparation of a pre-award IMP/IMS for your program, and may already have templates for your use.

Figure 7. Generic Pre-Award IMP/IMS.



3.1.3. RFP development guidance

3.1.3.1. Overview.

This pamphlet provides a general basis for developing an IMP and IMS, and one objective is to provide a consistent approach. For a Government-executed program, the Government team can tailor this guidance to its in-house program, and in a sole source contract environment, the Government-contractor team can work together directly to tailor the IMP/IMS to the program. In a competitive environment, however, the Government must communicate its IMP/IMS requirements to the offerors so industry can effectively develop the IMP/IMS to reflect both

the customer's requirements and its own proposed approach to executing the program. The Procuring Activity should initially communicate their requirements through Industry Days and then include them in the draft and final RFPs (Section L), using this pamphlet as a referenced guidance document and including any program-unique tailored requirements.

3.1.3.1.1. Minimizing guidance.

In the acquisition of a new aircraft, where weight usually drives cost and performance, there is an old saying that any new capability or piece of equipment needs to "earn its way onto the aircraft." The same adage should apply to the IMP/IMS requirements placed in Section L of the RFP. The Procuring Activity should minimize the number of additional requirements for the IMP/IMS. There are several reasons for this:

One of the most important acquisition reform initiatives calls for the contractor/offeror to write the SOW, as opposed to having it provided by the Government. This reform initiative is based on the tenet that the customer should be telling the offerors "what it needs" rather than "how to build it." It gives the offerors the ability to tailor the SOW to their individual approaches and to their specific risks. At the same time, it provides the Government with an excellent tool for evaluating each offeror's understanding of the problem and the soundness of their approach in the source selection process. The same tenet applies to the IMP/IMS.

In today's environment, the offerors usually have limited resources (including personnel and funds) to apply to building a competitive proposal. It is in the best interest of the Government to have those limited resources focused on building a solid execution plan, rather than applied to meeting a large set of supplementary requirements that add only marginal value to the end product. For example, one Government RFP placed 23 "additional requirements/constraints for the IMP/IMS" in Section L. Many of these constraints conflicted with each other, and the industry teams spent considerable labor hours trying to meet them, only to find that the Government was violating a number of these constraints in its own internal scheduling and planning.

Often, what seems to be only a small change or an "easy to do" requirement can require the expenditure of a disproportionate number of hours by offerors to meet it. For example, one final RFP changed a required "text field" in the IMS from what had been in all of the prior draft versions of the RFP. The offeror had already built over a hundred special IMS sorting filters based on the previously required text field, and had to manually change every one.

3.1.3.1.2. Referring offerors to the pamphlet.

There should be no need to duplicate the information in this pamphlet in an RFP. The best approach is to simply reference the pamphlet and make it available to offerors. Use the RFP Section L to provide the supplemental requirements and guidance for tailoring the IMP/IMS for a specific program. The contractor should be encouraged to propose the systems they will actually use to plan and manage.

3.1.3.1.3. Reviewing the RFP.

Offerors should also review Section B (Supplies or Services and Price/Costs), Section F (Deliveries or Performance), and the CDRL (DD Form 1423), since these sections will

often provide supplemental requirements to be considered in the development of the IMP/IMS.

3.1.3.2. Specific RFP guidance.

The following are specific areas where supplemental guidance may be needed.

3.1.3.2.1. Minimum required activities.

The Government should provide a list of any minimum required activities they want addressed in the IMP/IMS. These may be events, accomplishments, or criteria, and may be derived from the Government Roadmap IMP/IMS, user operational requirements, or internal program/project office requirements. For example, the Roadmap IMP/IMS may have events for Operational Test & Evaluation (OT&E) and Initial Operational Capability (IOC), which would be appropriate events for the Execution IMP/IMS. Another example would be a user's Capabilities Development Document (CDD) (formerly the Operational Requirements Document) or Statement of Objectives (SOO) which might define criteria for a Site Activation, or for IOC. These criteria could be provided for inclusion in the IMP/IMS. Finally, the program office may desire a "First Flight Test Readiness Review (TRR)," and should include this requirement in the RFP. In this case, the offeror could decide to include the TRR as an event, or perhaps as an accomplishment, supporting an event for "First Flight."

3.1.3.2.2. Date constraints.

Although the IMP is an event-driven plan, there may be some "hard date" constraints in the Government Roadmap IMP/IMS that have to be carried into the Execution IMS, such as a directed IOC date. These should be provided either in the RFP, the RFP library as part of the Government Roadmap IMP/IMS, or during Industry Day/Pre-Solicitation conferences.

3.1.3.2.3. Size of IMP/IMS.

There is no "standard" size for an IMP/IMS in a proposal. The offeror should strive to build an IMP and IMS of sufficient detail to fully describe the program for the Government's evaluation and to manage their own day-to-day execution of the program after contract award. The offeror should succinctly describe the work required to complete the contract in sufficient detail to fully demonstrate an understanding of the scope and flow of the work. The size of the resulting IMP and IMS is dependent on numerous factors such as the length, content, and complexity of the contracted program, the amount of new development, the technical risk and associated risk mitigation activities, and the scope of required testing. Because the IMP normally becomes a contractual document defining the event-driven program approach, it should not be page or line limited.

3.1.3.2.3.1. Optimizing IMS length.

The IMS is an extension of the information contained within the IMP, reflecting not only the events, accomplishments, and criteria identified in the IMP, but also tasks and subtasks subordinate to the criteria. An IMS summarized at too high a level may often result in masking critical elements of the plan to execute the program, and fail to show the risk management approaches being used. Further, it may often result in long duration tasks and artificial linkages, which will mask the true critical path. Conversely, too

much detail can make it more challenging to assess the IMS during source selection. The critical efforts and key risk mitigation efforts can get “buried” in the details. The offeror should use the IMS tasks when developing the “basis of estimate” (BOE) in the cost volume; those tasks should ultimately form the basis for the EVMS work packages. The IMS need not attempt to cover every possible program task, but should describe a realistic and supportable schedule illustrating the plan to meet all program requirements.

3.1.3.2.3.2. Limiting proposal IMS.

There may be times when it is necessary for the Government evaluation team to limit the initial IMS submittal size in order to better facilitate timely proposal evaluation. This situation may arise when the evaluating agency is resource limited and/or plans to perform a statistical risk analysis (see [3.1.5.9.2.](#) for discussion of statistical risk analysis) on a very complex program. If the Government believes an IMS line limit is appropriate, one-on-one discussions between the Government and offerors should be held as early as possible (e.g., industry days, bidder’s conference, etc.) to establish an appropriate IMS size limit consistent with programmatic requirements, and available source selection time and resources. It is essential the requirements of the RFP are consistent with any limits imposed on the IMS. In the event an IMS line or page limit is imposed, it must provide adequate lines for inclusion of the IMP events, accomplishments, and criteria.

3.1.3.2.3.3. IMS analysis techniques.

If the complexity, size, or other characteristics of the program force a relatively large IMS, the following are techniques that may aid the evaluators in performing a timely and effective evaluation:

- Focus the schedule and technical analysis efforts in areas of more obvious risk, based on the Government/Industry risk workshop’s risk matrix, and the offeror’s risk assessment and risk mitigation plans reflected in their proposal. Consider requesting that the proposed IMS flag these critical risk mitigation efforts in a separate field to permit easy filtering/sorting to highlight them for the evaluators (see [3.1.5.8.](#) on sorting the IMS).

- Focus the schedule and technical analysis on the tasks most likely to show up on the program critical path. Most statistical risk assessment models include a critical path analysis for all tasks during the simulation. Run an initial assessment, and then focus the evaluator’s efforts on those tasks that show on the critical path more than xx% of the time.

- Require the offeror to provide their minimum-maximum task duration with the supporting rationale for those tasks identified in paragraphs a. or b. above.

- Require early delivery (e.g., a couple weeks) of the IMP/IMS prior to the proposal to allow more time for evaluation. This is similar to what is frequently done for the Past Performance volume. Note that the evolution of the technical proposal occurs up to the last minute and associated changes should be reflected in the IMS.

- If multiple priced production options are included in the RFP, consider requiring the detailed IMS to include only the first priced option to illustrate the contractor's plan and schedule approach. Based on that IMS the Government could acknowledge and accept that the offeror is capable of planning/scheduling the other options. In the future, when the Government decides to exercise one of the future options, they then request the contractor submit a detailed IMP/IMS for that option.

3.1.3.2.4. Program-unique characteristics and requirements.

The RFP should address any unique aspects or interrelationships of the program that may affect the IMP/IMS. For example, if the software for an aircraft subsystem (for example, a missile) being developed must be delivered in time to support integration of the aircraft Operational Flight Program (OFP), that information should be provided, along with a schedule for the aircraft OFP. Another example would be modification kits that must be delivered to an ALC to support specific aircraft going through Programmed Depot Maintenance. Again, this type of information should be included in the RFP.

3.1.3.2.5. IMP narrative requirements.

If the Government desires IMP Narratives, the RFP should specifically state what types of narratives are desired. For process narratives, the RFP should identify any specific processes that the Government requires to be addressed. The RFP should also describe any particular content required in the narratives (for example, company standard process designation). "Contractor format" should be allowed for the narratives. Paragraph 3.1.4.6. provides further guidance for the preparation of the narratives. One common-sense goal is to avoid redundancy in areas where the RFP calls for the submission of a plan with the proposal. For example, if the RFP requests a Systems Engineering Plan be submitted with the proposal, it makes little sense to also request an IMP narrative on the systems engineering process. However, if the plan is to be submitted later as a data item, a proposal narrative on the systems engineering process may be appropriate.

3.1.3.2.6. Page limits for IMP narratives.

If narratives are desired in the IMP, a page limit may be desired for the narratives.

3.1.3.2.6.1. Page limit adequacy.

If an IMP narrative page limit is imposed, the Government team should ensure that the limit is consistent with the requested information. For example, one Government RFP levied a 20-page limit for the entire IMP, and at the same time provided the following guidance for the IMP Narratives:

Figure 8. Overly Prescriptive Instructions.

- ¶ Each narrative subject area shall be arranged in the following format: A. Objective; B. Identification of Governing Documentation; and C. Process (if applicable). The Objective is a brief statement of desired results and is to be traceable to the SOO. The Governing Documentation lists the Government documents and/or offeror practices or procedures to be used to achieve the objective. The offeror shall clearly state whether Government documents will be tailored further and reference in which of the offeror's compliance documentation they will be tailored. The narrative shall be consistent with applicable technical and management approaches described in the Mission Capability volume of the proposal.
- a. The offeror shall include the following specific areas of Government interest with narratives in the IMP (not listed in order of importance):
 - (1) Specialty Engineering Disciplines, (for example, Reliability and Maintainability (R&M), System Safety, Human Engineering, etc.)
 - (2) Integrated Logistics Support, including but not limited to training, tech order publications, and Non-Developmental Item/COTS utilization and support.
 - (3) Configuration Management Planning and Transition Configuration Management Planning.
 - (4) Software development plan that identifies:
 - (i) Integration between systems engineering processes and software development processes.
 - (ii) Assurance of software quality.
 - (iii) Development Test & Evaluation (DT&E) and OT&E planning, including completion of the Verification Cross Reference Matrix and participation in DT&E/IOT&E.
 - (iv) Development change control planning.
 - (v) Planning for reduction of life cycle costs
 - (5) System Integration.
 - (6) Risk Management.
 - (7) Potential approaches for accelerating the production schedule. Included as part of this discussion should be a list of long-lead items. Rough Order of Magnitude (ROM) estimates should accompany this information to support current Government FY funding decisions and should be provided as part of the Cost/Pricing information.
 - b. Additionally, the offeror shall consider the following when preparing the IMP:
 - (1) Failure and Deficiency Reporting, Analysis, and Corrective Action
 - (2) Government-Furnished Property (GFP) Utilization.
 - (3) System Security Engineering Management Planning.
 - (4) System Safety/Health Risk Engineering, Environmental and Hazardous Materials Management, and Hazard Status Reporting.
 - (5) Quality program planning.
 - (6) Planning for handling deviations and waivers.
 - (7) Planning for information data exchange with Government.
 - (8) Planning for subcontractor and associated contractor relationships."

The offeror was being asked to provide all of the above, along with all definitions, dictionaries, events, accomplishments, criteria, and any other supporting narrative in 20 pages. The requirements and the limits are obviously inconsistent.

3.1.3.2.7. Required data fields.

The Government team may want specific additional data to be included in the IMS. The reason for this additional data is frequently to support sorting of the IMS data using the different text fields as the sorting parameter. **Table 4.** gives examples of additional data that might be considered for inclusion. It is recommended that the Government not direct the use of specific fields for additional data. There are two reasons for this. First, certain fields may already be used by other “plug-in” programs for the automated scheduling tools. For example, “Risk+™,” a commonly used risk assessment plug-in for Microsoft Project, uses Text fields 8 and 9. The second reason is that the offerors/contractors may have internally-directed fields for data that are used to tie in with other automated enterprise tools (such as EVMS systems). Text fields are often used for additional data (in Microsoft Project). Other automated tools have similar capabilities.

Table 4. Additional Data Text Fields.

Additional Data	Text Field
IMP reference/code (single numbering system)	Text xx
WBS	Text xx
SOW Reference (if not same as WBS)	Text xx
IPT	Text xx
Mission Capability Subfactor (RFP Section M)	Text xx
Risk (Medium to High)	Text xx
Contract Line Item	Text xx
Organizational/Functional Code	Text xx

The IMP numbering, WBS, and IPT are probably the most commonly requested data fields, and provide the most value for traceability and for sorting of the data. The general nature of most RFP Section M (Evaluation Factors for Award) mission capability subfactors minimizes the value-added benefits of trying to trace each IMS task to a specific subfactor. The practice of identifying both a WBS and an IPT for each IMS task may make a requirement for an organizational/functional code unnecessary. The offeror may want to trace the tasks to individual Contract Line Items (CLINs) for accounting purposes.

In summary, it is up to each Procuring Activity to decide what additional data is needed for their program. Again, these requirements should “earn their way.” Also, the proposed IMS should clearly identify which fields are used for the data.

3.1.3.2.8. IMS hard copy format.

The IMS should almost always be submitted in an electronic format, which contains all of the IMS data and can be used to sort the data in different ways for evaluation. However, the Government team may also want a hardcopy submittal for evaluation purposes. In this case, rather than impose a boilerplate requirement in the RFP, it is recommended that the Government team review with the source selection evaluators what format is actually needed for evaluation. The formats most commonly used are:

Gantt Charts - A graphical display that depicts program work activities in an integrated fashion. Activities are represented by bars showing the length of time for each. These are often viewed in 11"x14" or 11"x17" pages.

Tabular Forms – Tables containing data for each activity. These are best viewed in a landscape format (size page dependent on number of data fields requested).

Use of data fields: Requesting a large number of data fields in the tabular format can significantly increase both the IMS size and the number of pages. Some RFPs have asked for over 20 fields to be included in the hardcopy submittal.

Use of multiple formats: Requiring submittal of **both** Gantt and Tabular hardcopy formats can easily drive page size and page count to an unwieldy level. For example, on a particular large program competition, both formats were required. At least one of the offerors used "custom –built" 11"x17" binders to hold the 150-page IMS to avoid manually folding 150 pages for each copy submitted. Again, it is important to consider the "value added."

Network Diagrams (Program Evaluation and Review Technique (PERT) Charts): These are charts that show all the task relationships. However, be aware that the network charts generated by automated scheduling tools (for example, Microsoft Project) may be extremely large and have to be printed on plotters. Some available "plug-in" tools make it easier to view and/or print network charts (for example, PERT Chart Expert for Microsoft Project), but the products are still significant in size in hardcopy formats. It may be easier to use views available in the electronic submittal to view the task relationships (see [3.1.5.7.2.](#)).

3.1.3.2.9. Electronic Format and Media.

Instructions as to the type of electronic format desired for the IMP (such as Microsoft Word document compatible with Office xx, or Adobe Acrobat pdf) and for the IMS (for example, Microsoft Project). Instructions as to the media to be used (CD-ROM).

3.1.3.2.10. Automated scheduling tool.

The Government team may have to dictate which automated scheduling tool it wants the offeror to use for the IMS submittal to facilitate evaluation. However, after contract award it is important that the Government use the same tool that the contractor uses for day-to-day execution of the program. Most schedule management tools have the capability to generate export files for MS Project. If the Government cannot manage data directly from the contractor's schedule management system, the contractor can be directed to periodically generate MS Project export files for the Government's use. This conversion may result in some loss of fidelity and may not fully enable day-to-day insight into contract execution.

3.1.3.2.10.1. Scheduling tool support.

If the Government allows the offeror to propose a tool that the Government team is not using, the RFP should ask the contractor to address issues such as post-award training of the Government team and software tool licenses.

3.1.3.2.11. Post-award data submittals.

The RFP should address the desired format for post award submittals of updates to the IMS. If a CDRL item is desired, then the RFP should identify the appropriate Data Item Description (DID) and any tailoring instructions. The current DID used for IMS is DI-MISC-81183. The DID should be structured to govern post-award submittals. It is recommended that the DID allow contractor format.

3.1.3.2.11.1. Excessive DID requirements.

If the DID is too detailed or prescriptive, it could lead to the maintenance of two separate products; the one the contractor submits, and another one used to actually execute the program.

3.1.3.2.12. Conflicting DID/RFP guidance.

CAUTION: should be taken to avoid providing conflicting guidance in the DID and Section L (Instruction to Offerors) of the RFP. To assist the offeror's teams in understanding and addressing the requirements discussed in this section, Appendix A to this document contains sample language for the offeror's SOW. Appendix B provides sample language for RFP Sections L and M.

3.1.4. Execution IMP development.

The same principles apply to the development of the Execution IMP, whether developed by a contractor or by the Government program/project office. For a Government-executed program or a sole-source contractor-executed program, the team can proceed directly from development of the Government Roadmap IMP/IMS to development of the Execution IMP.

3.1.4.1. Introduction.

For competitive programs, the offerors will develop the Execution IMP for submittal with their proposal in response to the RFP. This proposed Execution IMP will be used in source selection as a tool for evaluating the offeror's understanding of and approach to fulfilling the Government's requirements. The successful offeror's IMP will be included in the resulting contract for use in the execution of the program (see [paragraph 3.2.2.](#)).

3.1.4.1.1. Top-down analysis.

Prior to developing the IMP (and its attendant IMS), the offeror's team must fully understand the overall system acquisition requirements. For competitive proposals, these will be contained in the RFP. The team should first select the system-level events, which will serve as "progress checkpoints" and be used to indicate the readiness to move to the next group of work efforts. The next step is to identify the accomplishments and criteria to support each event. The individual IPTs should discuss and iterate these criteria and accomplishments with the "system-level" IPT to ensure that all critical activities from each functional discipline for all products are reflected in the IMP. It is important that significant subcontractor activities also be included in the Execution IMP. These in turn should be supported by the subcontractor's IMP/IMS or equivalent. The activities selected for inclusion in the IMP should not be ones expected to routinely change, since this would drive frequent contract modifications.

3.1.4.1.2. Event versus accomplishment versus criterion.

It should once again be emphasized that the distinction between events and accomplishments is often gray, as well as that between accomplishments and criteria. Very often the

determination is a factor of the complexity, size or length of the program or project. It is not unusual to see the same activity designated an event in one IMP, and as an accomplishment in another. Similarly an accomplishment in one program may be a criterion in another, or a criterion in one might be an accomplishment in another, or even a task in the IMS. Examples of these “flexible” activities will be provided in 3.1.4.3. through 3.1.4.5. The intent of the IMP is met as long as each activity supports the one above it, progressing from criterion to accomplishment to event.

3.1.4.1.3. Sequence of efforts.

The typical steps in the development of an IMP are:

- Determine the IMP structure/organization.
- Identify Events, Accomplishments, and Criteria.
- Prepare introduction and narrative sections (may/may not be requirement for narratives).
- Complete the single numbering system.
- Iterate events, accomplishments, and criteria with the IPTs during IMS development.

3.1.4.2. IMP Organization.

This pamphlet recommends the following as a common IMP structure to organize the previously defined elements of an IMP. However, this structure can be tailored as necessary to meet individual program/project needs, providing the structure is understood and useable by the entire Government/offeror team:

- Section 1 - Introduction.
- Section 2 - Events, Accomplishments, and Criteria.
- Section 3 - IMP Narratives (if required).
- Section 4 - Glossary.

3.1.4.2.1. Section 1 – Introduction.

The Introduction should include items such as the following:

- Short description of the program.
- Assumptions/Ground Rules.
- Event and “Action Term” Dictionary (expanded below).
- IPT Organization and responsibilities.
- Description of any unique or different features of your IMP.

3.1.4.2.1.1. IMP dictionary (event definitions, action terms).

Every IMP should include a dictionary with definitions of each of the events, as well as a common definition of the “action terms” used in the accomplishments/criteria descriptions (such as approved, submitted, verified, validated, and assembled). As the IMP becomes a contractual document, the dictionary and the definitions are critical to

avoiding misunderstanding and conflicts after contract award. Early discussions with the contractor are highly recommended to specifically address these items since different expectations between the Government and the contractor often result in both schedule and cost impacts. One example of an event dictionary section is shown as [Table 5](#), and an example of an “action term” dictionary is shown as [Table 6](#). (In some cases, the Procuring Activity may want the IMP Event table to include expected completion dates, which would be the fallout dates from the IMS. If used, these dates may become contractual dates that must be met, and could be tied to other contractual items, such as Award Fee. The Procuring Activity should clearly state whether the dates are intended to be contractual or simply for information. If the dates are to be contractual, it may be wise to add them to the IMP in stages as the program matures.)

Table 5. Event Definitions.

EVENT	DEFINITION
Post-Award Conference (PAC) Completed	The purpose of this event is to ensure that the contractor’s management processes and tools have been implemented and that both the Government/contractor have a common understanding of the program to be executed. The IMP Accomplishments and Criteria and overall schedule will be reviewed, as well as risk status and program metrics. The PAC Event represents the transition from initial post-contract award process implementation and planning updates to a major block of activity related to ...
Critical Design Review (CDR) Completed	The purpose of this event is to ensure that the detail design is essentially complete. It will (1) determine that the detail design under review satisfies the performance and engineering requirements; (2) establish the detail design consistency; (3) assess risk areas (on a technical, cost, and schedule basis); and (4) finalize the preliminary item specifications for the subsystems.
Functional/Physical Configuration Audit (FCA/PCA) Completed	The purpose of this Event is to ensure that the contractor has established a baseline design and physical configuration that meets the performance requirements of the program. It includes validation that the development of a configuration item has been completed satisfactorily and that the configuration item has achieved the performance and functional characteristics specified in the functional or allocated configuration identification. It also includes a technical examination of designated configuration items to verify that the configuration item “As Built” conforms to the technical documentation which defines the configuration.

Table 6. IMP “Action Term” Definitions.

analysis/analyzed	The subject parameter(s) has been technically evaluated through equations, charts, simulations, prototype testing, reduced data, etc.
approved	The subject item, data, or document has been submitted to the Government and the Government has notified the contractor that it is acceptable. For some data items, it is specified that no response constitutes approval.
available	The subject item is in place. The subject process is operational. The subject data or document has been added to the Data Accession List
complete(d)	The item or action has been prepared or accomplished and is available for use and/or review.
concurrence	The Government has expressed its agreement with the contractors proposed design, approach, or plan as documented in either formal correspondence or meeting minutes, presentations, etc.
conducted	Review or meeting is held physically and minutes and action plans are generated. Test or demonstration is performed.

3.1.4.2.2. Section 2 - Events, Accomplishments, Criteria.

This section should begin with a description of the single numbering system used, then list (preferably in table format) of Events, Accomplishments, and Criteria. An example is provided in [Table 7](#). Again, the WBS elements related to each Criterion would represent a roll-up from each Criterion’s supporting tasks in the IMS. A full IMP table for a sample “generic” program can be found in Appendix E, along with an “action–verb” dictionary.

Table 7. IMP Events, Accomplishments, and Criteria.

Activity #	Event Accomplishment Criteria	WBS Ref
A	Post Award Conference (PAC) Completed	-
A01	Integrated Product Teams (IPTs) Fully Staffed and Chartered	-
A01a	IPT Contractor/Govt Members Identified	12120
A01b	IPT Charters Approved	12500
A02	Management Processes and Tools Implemented	-
A02a	Sys Engr/Program Mgt Processes/Tools in Place (IMP, Config, Quality)	12120, 12150, 12200
A02b	Business Mgt Processes/Tools (EVMS, WBS, Subcontract Mgt) in place	12120

3.1.4.2.3. Section 3 – IMP narratives (if desired).

- Task Narratives
- Process Narratives
- Other as necessary (for example, risk discussion)

3.1.4.2.4. Section 4 – Glossary.

3.1.4.2.5. IMP structure.

A considerable amount of discussion has focused on whether the IMP should be broken into sections by IPT or WBS elements. The recommendation of this pamphlet is that the IMP not be broken into sections, but kept as one “integrated” plan that encompasses all IPTs, WBS elements, and functional disciplines. Paragraph 3.1.5.8. provides a discussion of how to sort the electronic version of the IMS (and therefore the IMP, as all events, accomplishments, and criteria should be in the IMS) by IPT or WBS, or any other available fields.

3.1.4.3. Event selection.

Great care should be exercised in the final selection of the events framework upon which the IMP is constructed. Events should represent major points at which it is logical to measure program progress. They should be well distributed over the program/project period, and not inordinately clustered. It is not desirable to have too long a period pass without checking critical program progress. This can be avoided by including an event such as a “Production In-Process Review” to ensure timely program progress visibility. This is acceptable as long as there are definable accomplishments and criteria to support that event. At the same time, having too many events poses other problems, such as spending too much time and too many resources preparing for events rather than working the program activities. Many reviews will occur as part of the offeror’s proposed processes, but every review does not need to be considered an IMP event.

3.1.4.3.1. Government-specified events.

Normally, the entity executing the program (whether Government or contractor) selects the events. However, as discussed earlier, the Government team may specify a minimum number of events to be derived from the Government Roadmap IMP/IMS. The execution team will then expand on that minimum set of events. Some suggested sources for candidate events and/or event definitions are: the Government Roadmap IMP/IMS, the RFP (Section L, Section B), the program requirements documents, and legacy standards, such as MIL-STD-1521 (cancelled) (Technical Reviews And Audits for Systems, Equipment, and Computer Software), and EIA 632 (Processes for Engineering a System). Note that these two standards should be used for ideas and concepts but should not be referenced in the contract. Table 8. provides examples of commonly used events.

Table 8. Event Examples.

Technical and Management Review Events
- Post Award Conference (PAC) Completed
- System Requirements Review (SRR) Completed
- Preliminary Design Review (PDR) Completed
- Critical Design Review (CDR) Completed
- Functional Configuration Audit (FCA)* Completed
- Physical Configuration Audit (PCA)* Completed
Development Events
- Subsystem Fabrication Completed*
- Subsystem Integration Completed*
- System Integration Completed*
- Design Readiness Review (DRR) Completed
Demonstration/Verification Events
- Test Readiness Review (TRR) Completed *
- First Flight Readiness Review Completed *
- First Flight Completed
- DT&E/OT&E Completed
Key Decision Points Where Progress Needs to Be Measured, Demonstrated, or Reviewed
- Program Status Reviews Completed
- Progress Review #___ Completed
- Production In- Progress Review Completed
- Low Rate Initial Production (LRIP) Decision Completed
- Full-Rate Production Decision Completed
Key Production/Operational Events
- Production Readiness Review (PRR) Completed *
- Low Rate Initial Production (LRIP) Completed
- Production Lot ___ Completed
- Site Activation Readiness Review Completed *
- Site Activation Completed
- Initial Operational Capability (IOC) Completed

NOTE: * These could also be accomplishments in support of other events rather than an individual event. For example, the “Test Readiness Review” could be placed in the IMP as an accomplishment in

support of a “First Flight” event, or the “Production Readiness Review” could be an accomplishment in support of an “LRIP Decision” event.

3.1.4.4. Accomplishment selection.

Similar to “Event Selection,” the accomplishment selection should reflect, as a minimum, any requirements and activities specifically identified in the RFP. The execution team will then identify additional selected accomplishments in keeping with the definitions provided in section 2. During this process, the team may identify additional required events, or may even determine that an already identified event should be deleted or replaced. There is no typical number of accomplishments for each event in the IMP. The important point is that each selected accomplishment when completed should substantially contribute to the success of the related event. **Table 9.** contains examples of accomplishments (indented under notional events).

Table 9. Examples of representative accomplishments.

Event
- Accomplishment
Preliminary Design Review Completed
- Design Implementation Trade Studies Completed
- System Architecture Update Completed
- System Requirements Allocation Completed
- All Functional And Physical Interface Requirements Identified
- Aircraft Preliminary Design Completed
- Preliminary Design Assessments Completed
- PDR Conducted
Critical Design Review Conducted
- Final Design Trade Studies Completed
- (System) Detailed Design Completed
- CDR Conducted
Test Readiness Review Conducted
- Test Assets Available*
- Test Planning Completed*
- Test Support in place
FCA/PCA Completed
- Formal Qualification Test (FQT) Completed
- Prototype Production Completed*
- FCA/PCA Conducted

NOTE: * These could also be criteria in support of other accomplishments rather than an individual accomplishment (for example, “Test Assets Available” could be placed in the IMP as a criterion in support of a “Test Readiness Review” accomplishment supporting a “First Flight” event).

3.1.4.4.1. Accomplishments and IPPD.

An important point must be made concerning accomplishments. Since the IMP is the product of an IPPD process, the accomplishments should reflect the required progress of all functional disciplines. For example, in support of a PDR event, the first accomplishments identified are almost always related to hardware and software design activities. However, it may be critical to program execution that well defined “long lead” materials or Government Furnished Equipment (GFE) be ordered by completion of the PDR so as to be available for the timely fabrication of Development, Test and Evaluation (DT&E) test articles. It is likely that preliminary logistics support activities will need to be completed in support of the PDR (such as initial provisioning conferences and preliminary support equipment

recommendation data submittal) In any such case, it is appropriate to identify accomplishments (or criteria, at a minimum) for these activities.

3.1.4.5. Criterion selection.

As with events and accomplishments, the criteria selection should reflect requirements specifically identified from the RFP. The execution team will then identify additional criteria in keeping with the definition provided in **paragraph 2.2.2.3.** The question that needs to be repeatedly asked when developing criteria is, “How do I know when an accomplishment has been completed?” The more definitive the IMP is, the clearer the understanding of the program will be. As with accomplishments, the team may identify additional required accomplishments and events, or may determine that an already identified accomplishment should be replaced. Again, there is no typical or required number of criteria for each accomplishment in the IMP. Generally, there should be at least two criteria to support an accomplishment, but there may be times when one is appropriate. The important point is that completion of the criterion should provide evidence of completion of the associated accomplishment. **Table 10.** contains examples of criteria (indented under the notional associated accomplishment and event). As explained in **paragraph 2.2.2.3.5.**, certain events lend themselves to the use of “exit” and “entrance” criteria. Some examples of these are also included in the table.

Table 10. Criterion Examples.

Event	
- Accomplishment	Entrance - ENT
-- Criteria	Exit - EX
Preliminary Design Review	
- Design Implementation Trade Studies Completed	
-- Airframe Preliminary Design Trade Studies Completed	ENT
-- Avionics Preliminary Design Trade Studies Completed	ENT
- System Requirements Allocation Completed	
-- System Requirements Allocated To Subsystems	ENT
-- Preliminary Segment Performance Requirement Documents Completed	ENT
- All Functional And Physical Interface Requirements Identified	
-- Preliminary Interface Definition Completed	ENT
-- Draft Interface Control Documents Completed	ENT
- Preliminary Design Assessments Completed	
-- Preliminary System Safety Hazard Analysis Completed	ENT
--- Design Risk Assessment Updated And Risk Reduction Options Identified	ENT
- PDR Conducted	
-- PDR Agenda and Data Items Submitted	ENT

-- PDR Meeting Conducted and Action Items Established	EX
Test Readiness Review	
- Test Planning Completed	
-- Approved Test Procedures Available	ENT
-- SEEK EAGLE Flight Clearance Obtained	ENT
-- Safety Review Board Completed	EX
- Test Support in place	
-- Support Assets Delivered (Spares, SE)	ENT
-- Tech Manuals Delivered	ENT
-- Flight and Maintenance Crew Training Completed	EX
Software Delivery 1	
- Delivery 1 Application Modules Completed	
-- Delivery 1 application software code and test completed	
- COTS and Applications Software Integrated	
-- All COTS hardware and software integrated	
-- All COTS hardware and software integrated with applications software	
- Delivery 1 External Interface Tests Completed	
- All IOC external interfaces defined	
-- All IOC external interfaces tested with development lab "live" links	
- Security Accreditation Completed	
-- On-site accreditation testing successfully completed	
--- Written approval for operation received from accrediting agency	
LRIP Decision	
Qualification Test and Evaluation (QT&E) Completed	
- FQT Completed	
-- QT&E Performed	
-- QT&E Failures Resolved	
- OT&E Completed	
-- OT&E Assets Delivered	
-- OT&E Performed	

3.1.4.5.1. Use of performance requirements.

There may occasionally be cause for using key performance requirements as criteria, particularly if the accomplishment is related to a technical demonstration of some sort. But the criteria should only make reference to the applicable specification paragraph(s) or area of

the technical requirements document or the system specification (for example, “Airspeed KPPs Demonstrated” or Radar Resolution TPM Demonstrated), and not quote the specific performance requirements. This would result in redundancy with the specifications and create the potential for contractual disconnects.

3.1.4.5.2. Handling “open items”.

Experience indicates that there will frequently be “open items” associated with the completion of events (for example, Major Review action items, Deviations, Waivers, retest). If the open items are severe enough, the event may be deemed incomplete and the program not allowed to progress further. However, there will be other times when it is prudent to identify action items and their closure plans, but designate the event as completed. One possible way to achieve this flexibility and still maintain program discipline is to place a criterion in each event for the “resolution of action items” from the previous event.

3.1.4.6. IMP narratives.

If the Government RFP requests the inclusion of IMP narratives, they should be placed in this section. Following is general guidance for the preparation of IMP Narratives:

3.1.4.6.1. Task narratives

Task narratives can be used to describe tasks that are not normally found in the IMP (for example, the conduct of a System Safety program or Quality Assurance program, which are Level of Effort (LOE) tasks) or broad-level tasking traditionally found in the SOO or SOW. If a task narrative describes efforts related to a specific SOW task, then it is desirable to reference the SOW paragraph number, as well as the applicable WBS, in the narrative. Task narratives would be a definite requirement if the program were to decide to use the IMP in lieu of a SOW.

3.1.4.6.2. Process Narratives.

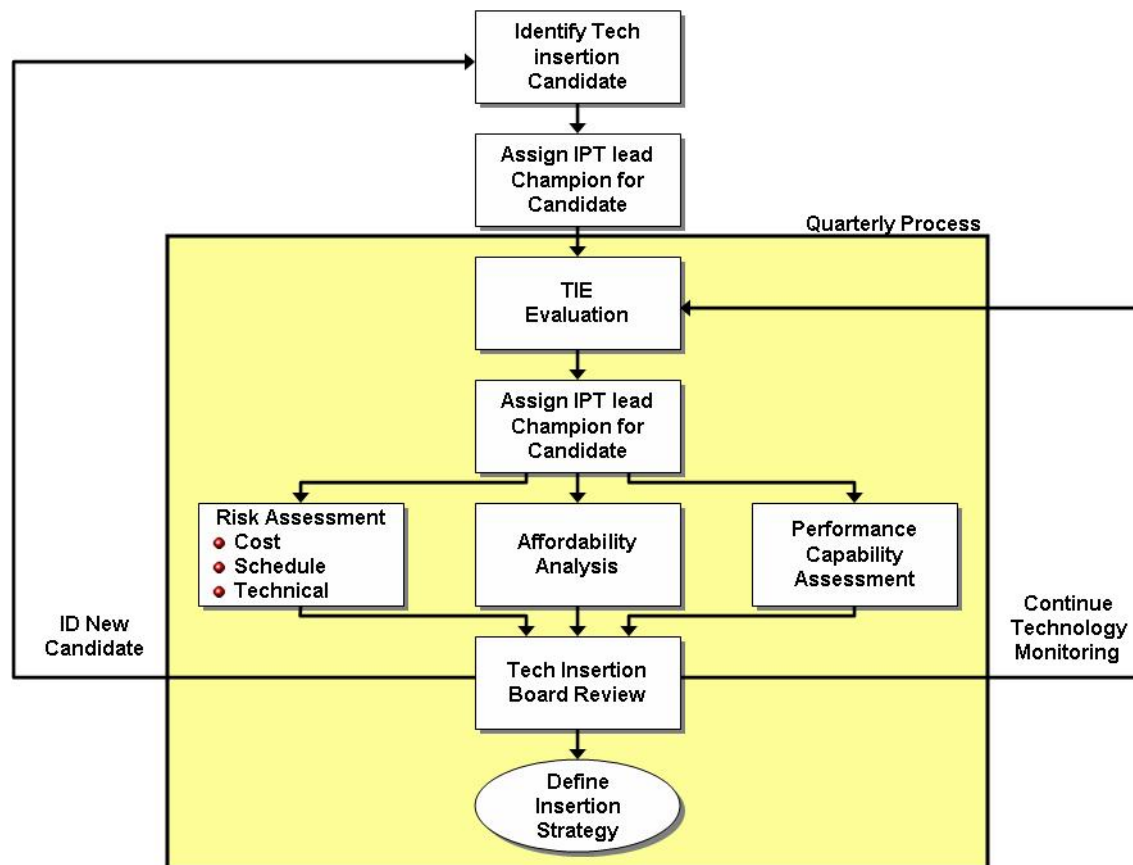
In general, the narrative should address only the key elements of developing or implementing a process/procedure (i.e., what the process/procedure will be or how it will be tailored and/or implemented on the specific program or project.). The narrative is not the forum for providing supporting information or rationale. This information should be provided in the technical/management proposal. As with task narratives, process narratives should reference a SOW paragraph number and WBS, if applicable.

3.1.4.6.3. Process narrative development.

The offerors should begin by deciding which critical processes will be included in the narratives, in addition to any minimum set requested in the RFP. Each individual process narrative should include the following types of information:

- Reference to any governing documentation, such as the contractor’s standard process, or any governing DoD/service guidance.
- An overview of the process. The use of process flow diagrams ([Figure 9](#).) is highly effective and is encouraged.

Figure 9. Technology Insertion Process Example.



- If the process is an existing one, describe how it will be tailored to the specific program/project.

- Describe how the process will be implemented on the specific program/project.

- Provide a description of any metrics that will be used to measure the process.

3.1.4.6.3.1. Capturing LOE products in the IMP/IMS.

While descriptions of LOE tasks and processes can be placed in the IMP narratives, there may be significant and specific outputs of these tasks and processes. Examples would be a Quality Assurance Plan or a System Safety Hazard Analysis. These types of outputs should be reflected in the IMP and/or IMS.

3.1.4.6.4. Other IMP narratives (as necessary).

This is where the offeror can provide any additional information to enhance both the offeror's and the Government's understanding of the program.

3.1.5. Execution IMS development.

To develop the Execution IMS, the execution team will have to capture all tasks that constitute the work required for successful completion of the program. These tasks are the time phased, detailed activities required to support the IMP criteria and accomplishments, and are a natural extension of the IMP. Consequently, the IMS uses the IMP events, accomplishments, and criteria as the skeletal

structure for determining the detailed tasks. The detailed tasks represent the individual pieces of work effort that consume resources and that are completed in support of each of the specific criteria. The descriptive labels used in the IMS should be identical to those used in the IMP. Each event, accomplishment and criterion should be labeled with a brief descriptive title, and should be numbered or coded to correlate to the IMP. Through this structure, the IMS tasks will be directly traceable to the IMP.

3.1.5.1. Transition from IMP.

The IMS provides the dates by which each of the IMP criteria, accomplishments, and events will occur by providing the timing of all the detail regarding the actual work toward them. It is, therefore, only after developing the IMS that the expected dates for completion of the contractual IMP items can be determined. Since all IMP items are normally present in the IMS, there will be associated dates for each. These dates are naturally subject to change as the program proceeds and actual progress does not match precisely with planned progress. As explained earlier, this is one of the reasons for not making the IMS a contractual item. The other is that some of the tasks may change for a variety of reasons, without affecting the validity or completion of the criteria. Although specifying dates is not recommended, the Government may specify a limited number of date-related delivery events required by other parts of the contract (see guidance in **paragraph 3.1.3.2.2.**, Date Constraints).

3.1.5.2. IMS objectives.

The IMS is a living document that is continuously updated to reflect the progress of the program or project. Some of the objectives of an IMS are as follows:

- Maintain consistency with the IMP
- Illustrate the interrelationships among events, accomplishments, criteria, and tasks
- Illustrate the start and completion dates for each event, accomplishment, criterion and task
- Indicate the duration of each event, accomplishment, criterion, and task
- Provide for critical path analysis
- Provide the ability to sort schedules multiple ways (for example, by event, by IPT)
- Provide schedule updates on a regular basis
- Provide an up-to-date indication of all completed actions
- Indicate schedule slips with original and reschedule dates
- Provide electronic access to the current master program schedule for contractor, Government, and support contractor personnel
- Provide the capability for the Government, contractor, or support contractors to perform “what if” schedule exercises without modifying the master program schedule
- Maintain consistency with the work package definitions and the EVMS
- Be traceable between the WBS items supported by each IMS task

3.1.5.3. Sequence of efforts.

The typical steps in the development of an execution IMS are:

- Determine the IMS “hard copy” organization
- Transport the IMP events, accomplishments, and criteria into the automated tool being used
- IPTs identify the detailed tasks and durations
- IPTs identify the task constraints and relationships
- IPTs iterate with the IMP/IMS facilitator point of contact
- Complete/update the single numbering system
- Complete a critical path/schedule risk analysis
- Complete the IMS document

3.1.5.4. IMS Organization.

The Execution IMS will normally be developed using an automated scheduling tool and will primarily exist as an electronic file. The initial electronic IMS will typically have four levels of indenture: events, accomplishments, criteria, and tasks (see [Figure 9](#)). However, there may be times when less than four levels are appropriate (for example, a criterion is a specific activity that doesn’t need to be broken down further, and a duration and relationship is assigned at that level). On the other hand, it may be appropriate for the IPTs to break some IMS tasks down further in the form of subtasks. Paragraph [3.1.5.5.2](#) provides further discussion of subtasks.

In [Figure 10](#), the contract award date is placed at the beginning of the IMS, as well as a listing of all the IMP Events. By tying this list to each of the event completions within the body of the IMS, a quick summary of the event completion dates is created.

For each proposal a hard copy IMS document is normally created and submitted, in addition to the electronic file. This document is used to facilitate evaluation, and allows the offeror to provide additional information on the IMS. The following is one suggested format for the IMS. This structure can be tailored as necessary to meet individual program/project needs.

Figure 10. IMS Levels of Indenture.

ID	Task Name	Dur	Start	End	A	G	O	N
1	PROGRAM	1 d	10/1/01	10/1/01				
2	Contract Award	1 d	10/1/01	10/1/01				
3								
4	IMPEVENTS	1 d	10/1/01	10/1/01				
5	A - Post Award Conference (PAC)	0 d	10/29/01	10/29/01				
6	B - Preliminary Design Review (PDR)	0 d	1/29/02	1/29/02				
7	C - Critical Design Review (CDR)	0 d	5/28/02	5/28/02				
8	D - Test Readiness Review (TRR)	0 d	8/1/02	8/1/02				
9	E - FCA/PCA (FCA/PCA)	0 d	10/31/02	10/31/02				
10								
11	EVENT	1 d	10/1/01	10/1/01				
12	Accomplishment	1 d	10/1/01	10/1/01				
13	Criteria	1 d	10/1/01	10/1/01				
14								
15	Post Award Conference (PAC)	31 d	9/17/01	10/29/01				
16	Integrated Product Teams (IPTs) Staffed and Chartered	15 d	10/1/01	10/19/01				
17	IPT Contractor/Govt Members Identified	15 d	10/1/01	10/19/01				
18	Complete staffing of Contractor IPTs	15 d	10/1/01	10/19/01				
19	Identify SPO IPT members	10 d	10/1/01	10/12/01				
20	Identify other Contractor IPT members	10 d	10/1/01	10/12/01				
21	IPT Charters Approved	15 d	10/1/01	10/19/01				
22	Prepare Team Charters goals	10 d	10/1/01	10/12/01				
23	Coordinate and approve Team Charters	5 d	10/15/01	10/19/01				
24	Initial Subcontractor/Associate Contractor Start-Up Complete	30 d	9/17/01	10/26/01				
25	Initial Subcontracts awarded	20 d	9/17/01	10/12/01				
26	Turn on _____ subcontract	10 d	10/1/01	10/12/01				
27	Turn on _____ subcontract	5 d	10/1/01	10/5/01				

3.1.5.4.1. Section 1 – Introduction.

The Introduction should include items such as the following:

- Short overview of the IMS
- Assumptions/Ground Rules for the IMS (calendar used, holiday constraints, etc.)

NOTE: In most automated scheduling programs, there are five days in a week and 22 days in a month

- Describe any unique features of your IMS. The following are examples:

- Single numbering system description
- Additional data fields included (identify associated text/other field)

- Description of how the IMS and any changes to it will be managed

3.1.5.4.2. Section 2 – IMS hardcopy format.

As required in the RFP or as determined by the offeror:

- Summary Schedule (Gantt format – normally one page but could be longer for complex programs).
- Gantt format.
- Tabular format.

3.1.5.4.3. Section 3 – Schedule rationale (if necessary).

This section provides any supporting schedule rationale for items such as long task durations, task constraints other than “As Soon as Possible,” or very long lead/lag times. Paragraph 3.1.5.5.3. contains examples of schedule rationale.

3.1.5.4.4. Section 4 – Critical path and risk.

This section may include a hardcopy format (Gantt or Tabular) and a discussion of the program critical path. The critical path should be easily distinguishable in report formats. This would also be an appropriate section in which to discuss any schedule risk assessment performed by the offeror (see Paragraph 3.1.5.9. for further discussion of schedule risk assessment).

3.1.5.4.5. Section 5 – Glossary .

Provide a glossary of terms and/or acronyms used in the IMS.

3.1.5.5. Detailed task identification.

Each IPT will develop its portion of the IMS by determining what tasks are necessary to support the criteria and accomplishments of the IMP. For each task, the IPT will provide a task name (normally active present verb tense), a duration, constraint type, and relationship with other tasks (predecessor(s)). This will allow the identification of the critical path for the program. (3.1.5.6. and 3.1.5.7. provide further definition of task constraints and relationships). Minimum and maximum durations may be required for a statistical schedule risk analysis (discussed under 3.1.5.9.). The IPT should also confirm the related WBS element for each task with the IMP/IMS point of contact (POC), using the WBS Dictionary.

3.1.5.5.1. Iteration of tasks with criteria and accomplishments.

The building of the IMP/IMS is an iterative process. If an IPT, while building the IMS, should identify required tasks that don’t logically fall under existing identified IMP criteria, they should suggest the additional criteria and/or accomplishments, which those tasks would fall under. The desired result should always be a clear track from events to accomplishments to criteria to tasks. This makes it easier for the Government and the contractor to assess the progress and maturity of the program and ensures that the program is event-driven.

3.1.5.5.2. Subtasks.

In defining the tasks for the IMS, there may be a need to go to further levels of indentation, or subtasks, to capture the detail desired by the IPTs and to further define work packages. This is particularly true for higher-level tasks in the IMS describing work performed by major subcontractors. In this case, the initial prime contractor’s Execution IMS may contain a task, which is further broken down into subtasks within the subcontractor’s internal IMS. Depending on criticality, the breakdown to subtasks may be included in the prime’s IMS. The use of subtasks is not unusual, and is fully compatible with the IMP/IMS structure and philosophy. The numbering system must simply be further defined or extended (e.g., D01a02a or D01a02.1).

3.1.5.5.3. Long-duration tasks.

If the IMS has long-duration tasks (typically those over 125 days), the team should review these tasks to determine if further breakdown is appropriate. If not, the contractor may

want to provide the rationale in the IMS document (see [Table 8.](#) for examples). The same might be true for tasks with long lead or lag times (See [Table 12.](#) for examples). Also, it may be desirable to identify moderate-to-high risk tasks. This can be done through the use of text fields in the electronic file. Specific risk mitigation activities from the Risk Management Plan should be reflected in the IMS. The team may decide to include LOE tasks described in the IMP narratives. In this case, they should be placed at the end of the IMS and not be tied to the other tasks in the IMS.

Table 11. Duration Rationale.

TASK ID*	TASK NAME	DURATION	RATIONALE
A01a05	Procure/Receive Group B hardware for XXX	180d	Typical procurement time based on supplier quotes
E01c01	Conduct DT&E flight test	140d	Reflects the planned flight test period and includes x flights
E01c02	Perform DT&E data reduction, analysis and reporting as required	140d	Length runs concurrently to flight test timeline

Table 12. Long Lead-Lag Time Rationale.

TASK ID*	TASK NAME	LAG/LEAD	RATIONALE
586	Conduct aircraft thermal signature analysis	SS+110d	Does not need to begin until after a significant amount of flight test has been accomplished
727	Install avionics modernization kit on C-130H3 (BAE #3) and deliver	SS+77d	Lag to maintain a smooth production flow and avoid starts and stops

NOTE: * Task can be identified by either the IMP/IMS Activity number or the scheduling tool line number. Not all scheduling tools work the same. Some tools will actually change the scheduling tool line number if the activity/task is moved.

3.1.5.5.4. Avoiding LOE “capture” of the IMS.

Level of Effort (LOE) is a concept that allows cost accounting for activities that are ongoing and consume resources but are not discreet to the accomplishment of a particular program. For example, a program manager does whatever needs to be done on a daily basis, as does their secretary. These tasks cannot be determined before the program begins and are considered LOE. They will begin and continue as long as the program exists and will usually represent the cost of the salaries of those involved. They allow the accumulation of costs to the program, but do not represent the discreet activities to accomplish the program. The concept of LOE should not be confused with scheduling activities that are represented in the IMS, which should be more discreet. If LOE tasks are placed in the electronic IMS,

caution should be used to avoid these tasks “grabbing” the critical path. This can happen if any LOE task becomes the last completed activity in the IMS. This is most likely to happen during the running of statistical “Monte Carlo” risk assessment tools. This can be avoided by artificially keeping the completion date of LOE tasks well short of the program ending date and not allowing the duration to vary during the assessment. However, it is recommended that *no* LOE activities be included in the IMS, despite the fact that they must be included in the EVMS schedule system.

3.1.5.6. Task Constraints.

In building a program schedule, it is highly desirable to have all tasks start “As Soon As Possible.” Then the start date for each task will be determined by its relationship to other IMS tasks (its predecessors). However, there are instances where constraints may have to be placed on a task. The Execution IMS should not use hard constraints, such as “Must Start On,” “Must Finish On,” “Finish No Later Than,” or “Start No Later Than.” These types of constraints do not support a credible risk assessment and will produce unreliable results in a statistical risk assessment. There may be some hard constraints in the Government Roadmap IMP/IMS, which are dictated by higher authority, but they should not be carried as hard constraints into the IMS. It is recommended that the IMS use the following types of “soft” constraints:

- Start No Earlier Than
 - Tasks not controlled by the execution team, for which the team has been given projected dates (for example, GFE deliveries, common production line assigned dates)
 - Tasks, which may have to be scheduled in conjunction with other contractor programs for efficiency (for example, scheduled blocks of time in a shared production facility)
- Finish No Earlier Than
 - “Just-in-time” tasks on separate contracts (for example, desire to hold delivery on two components until third component is available)

It is recommended that the IMS provide a rationale for constraints other than “As Soon As Possible,” to enhance the understanding of all users of the IMS. **Table 13.** provides an example.

Table 13. Constraint Rationale.

TASK ID	TASK NAME	CONSTRAINT	RATIONALE
L02a01	Order XXX Group A & B production materials (Lot Y)	Start no earlier than	Represents the beginning of Fiscal Year, the earliest the Government can award the Production Option
# 324	Receive GFE Support Equipment	Start no earlier than	Projected earliest delivery by Government

3.1.5.7. Task relationships.

To build a truly integrated schedule that accurately reflects program/project status, all interrelationships and links among and between tasks must be identified. Without accurate relationships, the planned execution phasing will be wrong, the critical path will be wrong, and any statistical schedule risk assessment will be suspect. The IPT members responsible for the tasks must determine these relationships, and iterate them with other IPTs. The relationships are normally assigned to the tasks as predecessor relationships, and the automated scheduling tool will normally link and generate the listing of successor tasks. Following are the types of relationships used by Microsoft Project. Although the Finish-to-Start relationship is the “cleanest” and most preferred one, there are real requirements in many programs for all of the relationships.

- **Finish-to-Start (FS)** – This is the standard “one task must finish before another starts” link. For example, since a test cannot begin until test procedures are written, the prerequisite for the “Conduct tests” task is “Write test procedures” with an FS relationship. This is the cleanest relationship for critical path schedule analysis.

- **Start-to-Start (SS)** - This is used when one task cannot start until another starts (often involving some lag time). For example, a test is scheduled to go on for four weeks, but the task of gathering test results can begin one week after the start of the tests. Therefore, the predecessor for the “gathering results” task is “Conduct tests” with an SS+5d relationship.

- **Finish-to-Finish (FF)** – This is appropriate where only task completion (but not task start) is driven by another task. For example, the design of an air vehicle could start anytime, but cannot be completed until one month after wind tunnel results are available. In this case the “Conduct wind tunnel tests” task would become a predecessor for the “design the air vehicle” task with a “FF+22d” relationship.

- **Start-to-Finish (SF)** – This is used for administrative-type tasks, which are driven by another task. For example, in preparing the agenda two weeks prior to a review, this task is driven by the start of the review. If the review, which is driven by other tasks, should slip, you would probably want to delay the agenda preparation. The predecessor for the “Prepare agenda” task would be “Conduct the ___ review” with an SF-10d relationship. This could also apply to “just-in-time” activities (for example, delivery of support equipment for a test). This constraint is rarely used.

3.1.5.7.1. Tasks with no successor.

Most tasks will have both predecessors and successors, with a majority of finish-to-start relationships. However, there are cases where tasks may not have a successor. For example, the delivery of a mock-up to satisfy a CLIN, or the last delivery to a site, if no other task is dependent upon it, will not have a successor. If management philosophy dictates that all tasks have successors, an artificial accomplishment or criterion can be established at the end of the program, such as “All Contractual Tasks Completed,” and tasks, which normally do not have successors, can use this element as a successor.

3.1.5.7.2. Display of interrelationships.

Paragraph 3.1.3.2.8. highlighted the difficulty in printing a network (or PERT) diagram of reasonable size. However, it is possible in some programs to provide a view that illustrates network relationships. Figure 11. gives an example of such a view in Microsoft Project

that shows the predecessors and successors for any selected task. The view is a “combination” view, with the top half being a “Task” view and the bottom a “Task PERT” view:

Figure 11. IMS “Combination” View Showing Network Relationships..

Task Name	Dur	Start	Finish	Predecessors
15				
16 Post Award Conference (PAC)	32 d	9/17/01	10/30/01	
17 Integrated Product Teams (IPTs) Staffed and Chartered	15 d	10/2/01	10/22/01	
18 IPT Contractor/Govt Members Identified	15 d	10/2/01	10/22/01	
19 Complete staffing of Contractor IPTs	15 d	10/2/01	10/22/01	2
20 Identify SPO IPT members	10 d	10/2/01	10/15/01	2
21 Identify other Govt agency IPT members	10 d	10/2/01	10/15/01	2
22 IPT Charters Approved	15 d	10/2/01	10/22/01	
23 Prepare Team Charters, goals	10 d	10/2/01	10/15/01	2
24 Coordinate and approve Team Charters	5 d	10/16/01	10/22/01	23
25 Initial Subcontractor/Associate Contractor Start-Up Complete	30 d	9/17/01	10/26/01	
26 Initial Subcontracts awarded	21 d	9/17/01	10/15/01	
27 Turn on ___ subcontract	10 d	10/2/01	10/15/01	2
28 Turn on ___ subcontract	5 d	10/2/01	10/6/01	2

3.1.5.8. Sorting the IMS.

Throughout this pamphlet, we have referred to the capability of sorting the IMS by IPT, WBS, and other fields. This can usually be accomplished through the use of filters based on information contained in data fields. These filters can use almost any data field as a sorting parameter. In Microsoft Project, for example, one could use text fields for various data sorts. The filters permit quickly sorting the IMS tasks by categories such as IPT, WBS, or event. One way to make these filters quickly accessible in Microsoft Project is to build a custom tool bar with pull-down menus of the filters. **Figure 12.** contains an example of an IMS sorted by IPT (in this case, SS stands for System Support IPT) using a custom toolbar and pull-down menu. **Figure 13.** illustrates a sort by WBS using the same toolbar. The filters can be built to include only tasks or to include related summary activities (events, accomplishments, and criteria).

Figure 12. IMS Sorted by IPT.

Task Name	Dur	Start	Finish	IPT	WBS
Widget Program	369 d	4/15/03	9/10/04		
Event B - Final Design Review	92 d	4/16/03	8/21/03		
Design Definition Complete	88 d	4/16/03	8/15/03		
Design Deltas to Baseline Identified	88 d	4/16/03	8/15/03	WDM	
B01a01-1.3.1 Perform requirements delta analysis	22 d	4/16/03	5/15/03	WDM	1
B01a02-1.3.1 Perform engineering design for deltas	66 d	5/16/03	8/15/03	WDM	1
Drawings Complete (Baseline & Deltas)	43 d	4/30/03	6/27/03	WDM	
B01b01-1.1.1 Preparation of source control and manufacturing drawings	33 d	4/30/03	6/13/03	WDM	1
B01b02-1.3.1 Review by Engineering Manager	10 d	6/16/03	6/27/03	WDM	1
Initial Test and Manufacturing Planning Reviewed	49 d	4/16/03	6/23/03		
Acceptance Test Plan Complete	27 d	5/16/03	6/23/03	WDM	
B03a01-1.3.2 Prepare Acceptance Test Plan	22 d	5/16/03	6/16/03	WDM	1
B03a02-1.3.2 Accomplish Test Plan internal review	3 d	6/17/03	6/19/03	WDM	1
B03a03-1.3.2 Submit Acceptance Test Plan for approval (if required)	2 d	6/20/03	6/23/03	WDM	1
Manufacturing Plan Complete	32 d	4/16/03	5/29/03	WDM	
B03b01-1.2.4 Detail the milestone plan for transition to production	10 d	4/16/03	4/29/03	WDM	1
B03b02-1.2.4 Prepare Manufacturing plan for inclusion on DAL	22 d	4/30/03	5/29/03	WDM	1
Event C - Test Readiness Review/Production Readiness Review (TRR/PRR)	145 d	5/16/03	12/4/03		
First Article Build, Assembly and Inspection Complete	142 d	5/16/03	12/1/03		
First Article Material Purchase and Build Complete	112 d	5/16/03	10/20/03	WDM	
C01a01-1.2.2 Material Procurement (existing design - Version 1)	88 d	5/16/03	9/16/03	WDM	1
C01a02-1.2.2 Material Procurement (delta design - Version 1a)	44 d	8/20/03	10/20/03	WDM	1
C01a03-1.1.2.2 Fabricate in-house parts (existing design - Version 1)	66 d	5/16/03	8/15/03	WDM	1.1
C01a04-1.1.2.2 Fabricate in-house parts (delta design - Version 1a)	44 d	8/20/03	10/20/03	WDM	1.1
First Article Assembly and Inspection/Test Complete	54 d	9/17/03	12/1/03	WDM	
C01b01-1.1.2.2 Assemble first article (Version 1)	20 d	9/17/03	10/14/03	WDM	1.1
C01b02-1.1.2.2 Inspect/test First Article Version 1	10 d	10/15/03	10/28/03	WDM	1.1
C01b03-1.1.2.2 Assemble first article (Version 1a)	20 d	10/21/03	11/17/03	WDM	1.1
C01b04-1.1.2.2 Inspect/test First Article (Version 1a)	10 d	11/18/03	12/1/03	WDM	1.1
Test Planning complete	97 d	6/24/03	11/5/03		

Figure 13. IMS Sorted by WBS.

Activity	Dur	Start	Finish	IPT	WBS
31 A02a01-1.3.1	10 d	4/16/03	4/29/03	SEIT	
32 A02a02-1.3.1	5 d	4/30/03	5/6/03	SEIT	
48 B01a01-1.3.1	22 d	4/16/03	5/15/03	WDM	
49 B01a02-1.3.1	66 d	5/16/03	8/15/03	WDM	
52 B01b02-1.3.1	10 d	6/16/03	6/27/03	WDM	
55 B02a01-1.3.1	15 d	6/17/03	7/7/03	SEIT	
56 B02a02-1.3.1	2 d	7/8/03	7/9/03	SEIT	
58 B02b01-1.3.1	33 d	5/7/03	6/20/03	SEIT	
59 B02b02-1.3.1	10 d	6/23/03	7/4/03	SEIT	
60 B02b03-1.3.1	2 d	7/7/03	7/8/03	SEIT	
84 B04b01-1.3.1	2 d	8/18/03	8/19/03	SEIT	
86 B04c01-1.3.1	2 d	8/20/03	8/21/03	SEIT	
87 B04c02-1.3.1	2 d	8/20/03	8/21/03	SEIT	
131 C05a01-1.3.1	5 d	8/22/03	8/28/03	SEIT	
132 C05a02-1.3.1	2 d	8/29/03	9/1/03	SEIT	
133 C05a03-1.3.1	44 d	8/22/03	10/22/03	SEIT	

3.1.5.9. Schedule risk assessment.

After preparation of the IMS, it is appropriate to analyze the schedule and its associated risk. In competitive or sole source procurements, the offeror should perform an analysis and address it in the submitted IMS document. This analysis should include a discussion of the critical path, so as to identify tasks to be watched. The reader should be cautioned, however, about developing “tunnel vision” focused on the critical path activities. Many programs have been “bitten” not by the critical path activities, but by another activity just off the critical path. There are three basic types of schedule risk analysis:

- **Narrative Analysis** – This should be an explanation of the overall schedule risk, normally performed by the offeror and included in the IMS document. It would also include analysis of the critical path.

- **Technical Analysis** – This is a qualitative evaluation, normally performed by the Government source selection functional experts.

- **Statistical Risk Analysis (SRA)** – This analysis is also frequently referred to as the Statistical Risk Analysis (SRA). This is normally a “Monte Carlo” type simulation using software programs designed for that specific purpose (for example, “Risk+™,” a plug-in to Microsoft Project). The program performs simulated “runs” of the entire program many times while randomly varying the durations according to a probability distribution. The results indicate a “level of confidence” for the integrated schedule. The SRA can be performed by either or both the offeror and the Procuring Activity after assigning minimum and maximum durations for each task. The SRA can also be a valuable tool for “what-if” exercises to quantify the impacts of potential program changes.

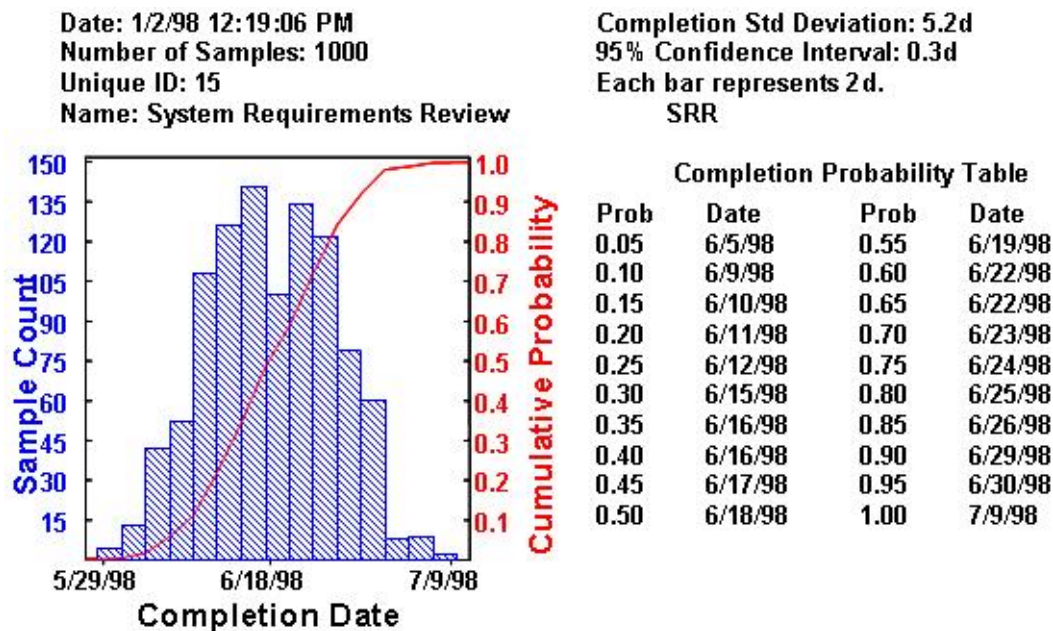
3.1.5.9.1. Contractor assessment of risk.

The Government’s assessment of what items are moderate or high risks may not match the offerors’ assessed risks for the proposed approach. Offerors should be allowed to identify any appropriate areas of risk and to discuss why the Government’s anticipated risk will not materialize using their approach. The potential schedule impacts of the technical risks associated with the offeror’s proposed approach is determined during the source selection process by examining the best/most likely/worst case duration of the workflow of activities associated with the specifically risky aspects of that offeror’s approach.

3.1.5.9.2. Statistical Risk Analysis (SRA).

If the Procuring Activity plans to do a statistical schedule risk assessment, the proposed IMS is typically requested in an electronic format that can be input to a schedule networking software that is compatible with the Government’s selected schedule risk assessment software package. The schedule team loads the offeror’s proposed schedule data and then may make adjustments to the data to reflect the Government technical team’s assessment of the contractor’s schedule. The schedule risk assessment software uses Monte Carlo simulations for each of the activities given the range of duration, for the purpose of determining a cumulative confidence curve. An example of a product from a “Risk+™” SRA is shown in **Figure 13**. Some SRA programs will also do a “critical path analysis,” identifying the number of times every task in the IMS shows up on the critical path during the simulation runs. This can be a great help in expanding the “tunnel vision” on critical path activities discussed above.

Figure 14. Sample SRA Results.



3.1.5.9.2.1. Meeting exact dates in the SRA.

When performing an SRA, it should be noted that the “confidence level” of making the exact dates in the IMS would typically be very low. This is not unusual, and occurs because during the simulation all tasks can expand to their maximum duration; how-

ever, not all can shorten to their minimum duration, because other tasks will move onto the critical path in their place. The definition of a “high confidence” schedule should take this into account, and set an acceptable band around the event completion dates.

3.1.5.9.2.2. Achieving SRA integrity.

It is very important to conduct a proper analysis concerning the potential causes for schedule disruption and to choose credible minimum, maximum and most likely durations. Often this process has been used to try to force-fit the schedules, using faulty assumptions. An SRA is only as credible as the minimum/maximum durations. It is important to have a good critical path network, with a minimum number of date constraints.

3.1.5.10. Resource loading of IMS.

This pamphlet does not recommend the resource loading of the IMS for proposal submittals. Depending on the individual program, it might be appropriate to add resource loading after contract award, if the same software tool is being used for cost accounting and reporting.

3.1.5.10.1. Resource loading and pricing.

In competitive procurements, the offerors will probably be making adjustment in resources and pricing right up until proposal submittal. It is very difficult to keep the resource loading in the IMS updated at this point. In fact, this loading will probably be adjusted after contract award, making the pre-award value doubtful.

3.1.6. IMP/IMS for evolutionary acquisition.

The new DoD acquisition policy (DoD Directive 5000.1 and DoD Instruction 5000.2, both dated May 2003) emphasizes the adoption of an evolutionary acquisition strategy, with either a spiral or incremental development process for new programs. The basic IMP/IMS philosophy for Evolutionary Acquisition is unchanged. However, what is to be actually placed in the IMP and IMS can vary significantly. In this case, it is recommended that the overarching Government Roadmap IMP/IMS capture as much as possible of the spiral/incremental development plan. This is particularly important, since an evolutionary approach will probably increase the number of interfaces and integrations for the total program. However, the Execution IMP/IMS should only treat those portions of the plans that can be fairly well defined (for example, priced options). Individual Execution IMP/IMS will then be developed for each successive spiral or increment of the evolutionary acquisition as they become more clearly defined and are placed on contract. The Individual Execution IMP/IMS should be linked back to the overarching Government Roadmap IMP/IMS.

3.2. Implementation/execution.

3.2.1. Pre-contract award.

The Government Roadmap IMP/IMS is developed and implemented by the Government team as early in the program as possible, i.e., in the pre-RFP phase. The Government Roadmap IMP/IMS will provide the framework for development and implementation of any Pre-Award IMP/IMS or Execution IMP/IMS. In the case of a Government-executed program or project, the Government team should proceed immediately into the preparation of an Execution IMP/IMS, which can be implemented immediately after preparation. In a sole source contract environment, the Govern-

ment/contractor team can likewise begin development of the Execution IMP/IMS. The resultant Execution IMP/IMS can be implemented as soon as contract authorization is given.

3.2.1.1. Government Pre-Award IMP/IMS for RFP development.

During competitive acquisitions, the Procuring Activity may decide to prepare and implement a Pre-Award IMP/IMS to better plan, manage, and track the activities required to get to contract award. Based on the Roadmap IMP/IMS, the procuring activity will then determine any program-unique requirements for the Execution IMP/IMS, for inclusion in the RFP. The offerors will then provide their proposed Execution IMP/IMS in their proposals, reflecting each one's unique approach to fulfillment of the program and technical requirements. These products will be evaluated by the Government source selection team in accordance with the evaluation standards detailed in Section M of the RFP.

3.2.2. Post-contract award.

When the contract is awarded, the IMP submitted by the winning contractor becomes a part of the contract. The IMS submitted will be baselined, and become the basis for updates normally submitted either as a CDRL, according to the instructions contained in the tailored DID, or through the DAL. This regular deliverable will be provided for day-to-day execution. Changes to either the IMP or IMS during program/project execution are discussed in [3.2.2.7](#). The following paragraphs discuss some of the different facets of post-award use of the IMP/IMS.

3.2.2.1. Communication.

Open communications and trust are critical during program execution. This includes communication between the Government and the contractor as well as internal Government communication among the various program teams and with other Government organizations. Execution IMP/IMS information is critical to providing the baseline for the communication and execution of the program. This is especially true for the program teams because of the complexity and the integrated nature of an acquisition program. Without a cross flow of information between the program IPTs, "team stovepipes" are created. It is important to recognize that most program events directly affect all IPTs and there is a need to establish a communication link that ensures that all interfaces are recognized and addressed. If problems are identified and addressed regularly in team meetings through IMS statusing, mitigation plans can be formulated to minimize program disruptions and their cost and schedule impacts.

3.2.2.1.1. Electronic data interchange.

In many programs, electronic data interchange is available between the contractor and the Government team. In these cases, the IMS could be made available to the Government team on an ongoing basis. However, it should be set up so that only the contractor can make direct changes to the IMS.

3.2.2.1.2. Avoid the micro-management threat.

Contractors may be reluctant to provide day-to-day access to the Government team if they believe it will result in micromanagement through the IMS. It is the responsibility of the Government team to avoid "killing the contractor with oversight."

3.2.2.2. Program tracking.

Updates to the schedule may be documented as they occur, however, a time for a “block change” of the IMS should be designated to ensure the schedule is kept current. As projected slips to the schedule become apparent, the impact to the critical path for that activity should be assessed, and work-around plans developed. If program status is being reviewed regularly in team meetings and through IMS statusing, the formulation of mitigation plans to minimize program disruption and to avoid cost and schedule impacts, should be an ongoing activity.

3.2.2.2.1. Work-around plans.

Work-around plans can be used at several different levels. At the program team level, the expected activities can be tracked and monitored at working group meetings (for example, the Integrated Test Team or the Integrated Logistic Support Working Group). The IMS documentation of what has to be accomplished to complete each of the activities is an invaluable tool to assess the current status and project potential problems in activity completion. To be effective, as soon as it is determined that scheduled tasks cannot be accomplished as required, management must be notified. Then the process can begin to assess the overall program impacts and formulate plans that will assure program integrity.

3.2.2.3. Program analysis.

From a program perspective, the Execution IMP is baselined and the associated IMS network schedule should be used as the starting point to assess and mitigate the impacts caused by program perturbations.

3.2.2.3.1. Directed budget cuts.

In the case of directed budget cuts, critical path analysis can be used as a starting point to identify items for potential cut that would cause the least program impact. More importantly, after identification of the efforts to be cut, the specifically impacted program teams can be tasked to assess the impacts to determine if they are feasible. This process has the potential to provide better impact analysis than previous methods. After the team’s analysis, they should be better able to execute the changes, since they helped analyze and define them, and to make them “more executable.” Conversely, if the impacts are unacceptable, the IMS information developed should help support the analysis, and lead to the identification of other options to be investigated.

3.2.2.3.2. “What if” exercises.

A complete IMS with well-defined relationships can be responsive to “what if” exercises at varying levels. Most “what if” exercises represent significant potential changes to the program funding, content and approach. A sufficiently descriptive IMS can be an invaluable tool for examining alternatives to provide meaningful answers to the questions conveyed in “what if” exercises. Statistical risk analysis tools like those described in **paragraph 3.1.9.2** can be used to support these “what if” exercises.

3.2.2.4. Currency of IMP/IMS.

When changes have to be made to the program, the Execution IMP/IMS must be updated to reflect the revised planning, and this must be communicated to all program participants. The program team should ensure that program financial planning and the EVMS baselines, if applicable, are adjusted to reflect the new, approved baseline. While the IMS will be continually updated, it is also recommended that the IMP be reviewed periodically as the program

matures. Factors such as program maturity, risk status, and funding changes could drive changes to the IMP.

3.2.2.5. Reporting.

Each program should determine the level and format for reporting program progress and problems to internal and external management. The program teams can internally track activities to any level they consider necessary, but will need to roll up those tasks to reflect the pertinent information desired at each management level. Internal program reviews may be conducted to provide senior management with the current execution status in terms of cost, schedule, and performance. The information required would be expected to be significantly less than that required by the program teams to perform comprehensive workload integration, but would be tailored to provide the information necessary for issue resolution. As guidance, the contractor shall submit an electronic schedule update and a monthly report containing a summary identifying progress to date, variances to the planned schedule, causes for the variance, potential impacts and recommended corrective action to avoid schedule delays. Actual start and completion dates shall be reported. The analysis shall also identify potential problems and provide a continuing assessment of the network critical path. Thresholds for impact reporting shall be identified on the DD Form 1423.

3.2.2.5.1. Other Government organizations.

The Execution IMP/IMS is also an extremely useful source of information that can be provided to outside organizations whose support is necessary for program continuation. These organizations may include Air Force, Congress, DoD, GAO, and the other DoD services on joint programs. Other traditional sources of program status information such as Cost Performance Reports, deliveries, and financial tracking are valuable, but usually would not provide the current, detailed information that is available through the Execution IMP/IMS statusing. Because of the level of integration inherent in the Execution IMP/IMS, it can be an invaluable tool in assessing the impact of funding cuts and other program iterations, with credible, consistent information.

3.2.2.5.2. Execution IMP/IMS.

Programs that have instituted an Execution IMP/IMS have used it as a key management tool to facilitate communication among the contractor teams and the Government, both day-to-day and in support of regularly-scheduled Program Management Reviews.

3.2.2.6. Other Uses.

When the Execution IMP/IMS is used as the baseline management tool for the day-to-day execution of the contract, it can be the source for other information required to satisfy program requirements. In other cases, especially in the financial area, detailed IMS program performance information can be used as a supplement and a crosscheck to the data provided in the existing financial systems.

The following are some areas where the IMP/IMS may be tied to other program requirements:

3.2.2.6.1. Contractor Performance Assessment Reports (CPARs).

Currently, program offices must document CPARs for all contracts with a face value of \$5 million or more to provide an objective evaluation of the contractor's performance on the

contract. If the Execution IMP/IMS is used as a management tool, much of the information required to assess performance for the CPAR is readily obtainable. This information can be used as justification and substantiation for the CPAR.

3.2.2.6.2. Award fee.

If the contract has an Award Fee provision, the Execution IMP/IMS information can be used to support and substantiate the program office evaluation in the same manner as within the CPAR. Also, successful completion of IMP/IMS events and associated accomplishments or criteria in the IMP/IMS can be tied directly to Award Fee criteria. In some cases, the Award Fee periods have been correlated with the completion of the events in the IMP and IMS. Also, the common baseline provided by the Execution IMP/IMS can be effectively used to focus work efforts that are critical to the accomplishment of the program.

3.2.2.6.3. Earned value management system.

EVMS is a management tool to track costs and program schedule execution by the IPTs. It is usually a computer-based system, using automated tools. Scheduling tools such as MS Project are not the primary tools in use for EVMS since they are more schedule-oriented than cost-oriented. They can be resource-loaded, but do not provide the same flexibility and capabilities for EVMS as do other tools. However, data from automated scheduling tools can usually be directly input into many of the EVMS tools in use. Therefore, there should be direct traceability between the cost data being collected by the EVMS and the IMS being used by the IPTs, or analysis of reporting variances will suffer. To ensure this traceability EVMS work packages should consist of tasks from the IMS, and IMS tasks should be directly referenced to the WBS. Use of the sorting capability, described in **paragraph 3.1.5.8.**, can facilitate the input of IMS updates directly into the EVMS system. It is also recommended that both the EVMS data and the IMS activity be checked periodically by the responsible IPTs to ensure changes are consistently reflected in both.

3.2.2.7. IMS change control process.

As indicated in earlier chapters, the Execution IMP formulated in the source selection process (or in a sole source environment) may require modifications during the performance of the contract. The contents of the IMS, unlike the IMP contents, are not contractually binding. The change process for the IMS, therefore, is less rigorous than the contractual process needed to change the IMP, but no less important. Configuration control of the IMS must be in place and can be achieved by using a structured change process. Many companies already have existing policy statements that describe their process for maintaining configuration control over their scheduling processes. For some organizations, however, this may need to be developed. For all programs, the change control process should be reviewed and tailored to meet any unique needs of the program. The following information and characteristics should be covered:

3.2.2.7.1. Process elements.

The IMS changes control process would be clearly stated, to cover the following:

- The documentation, coordination and approval of IMS changes.
- The identification of the IPT responsible for performing the changes and maintaining configuration control.

- How the IMS changes are monitored and controlled.
- How the IMS revisions are published and distributed to program personnel.

3.2.2.7.2. Program baseline.

The IMS should be established as the schedule baseline against which performance is measured. After the contract has been awarded, the IMS will become the schedule baseline for the program, and management will execute the program using this plan. Sometimes realities of program execution lead to a variation between planned progress and actual progress. Workarounds will have to occur to return to the program baseline approach. When this occurs, the adjusted plan should be shown in the IMS; however, the original IMS should be archived for reference. These “changes,” or workarounds, should follow the documented IMS change process.

Table 14. IMP/IMS Related Websites.

Website	Address	General Content	Remarks
OSD(AT&L) Knowledge Sharing System	http://akss.dau.mil/jsp/default.jsp	Broad spectrum of acquisition information.	Current home of the DAU version of Deskbook.
OSD Earned Value Management	http://www.acq.osd.mil/pm/		
ASC/PM's IMP/IMS	https://www.aekm.wpafb.af.mil/FoldrViewL.jsp?id=FolderHome.AEKM.1039722429397	Includes training module and examples.	
Defense Acquisition University (DAU)	http://www.dau.mil/	Broad spectrum of acquisition information	
DoD Guide to Integrated Product and Process Development (Version 1.0) February 5, 1996	http://www.acq.osd.mil/io/se/ippd/guide/table_of_contents.html#toc	Early DoD introduction to IPPD.	

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

Data Item Description (DID) DI-MISC-81183B, *Integrated Master Schedule (IMS)*.

DoDD 5000.1, *The Defense Acquisition System*

DoDI 5000.2, *Operation of the Defense Acquisition System*

EIA 632, *Processes For Engineering A System*

MIL-HDBK-881B, *Work Breakdown Structures for Defense Material Items*, 2 January 1998:

<http://www.acq.osd.mil/pm/newpolicy/wbs/wbs.html>.

DSMC Scheduling Guide for Program Managers:

<http://www.dau.mil/pubs/gdbks/schedulinguide.pdf>

Glossary of Defense Acquisition Acronyms and Terms (2001):

<http://www.dau.mil/pubs/glossary/glossary.pdf>

SAF/AQ, 24 February 2004, Memorandum: Interim Policy Memo on Expectation Management in Acquisition (Policy memo 03A-006, 29 April 2003): <http://www.safaq.hq.af.mil/ACE>

SAF/AQ, 7 January 2004, Memorandum: Revitalizing Air Force and Industry Systems Engineering (SE) – Increment 2: <http://www.safaq.hq.af.mil/ACE>

OUSD/AT&L, 20 February 2004, Memorandum: Policy for Systems Engineering in DoD:

<http://akss.dau.mil/docs/Approved SE Policy Memo-20Feb04-Wynne.pdf>

Abbreviations and Acronyms

AFMC—Air Force Materiel Command

ALC—Air Logistics Center

BOE—Basis of Estimate

CDD—Capabilities Development Document

CDR—Critical Design Review

CDRL—Contract Data Requirements List

COTS—Commercial-Off-The-Shelf

CPAR—Contractor Performance Assessment Report

DAL—Data Accession List

DID—Data Item Description

DoD—Department of Defense

DRFP—Draft Request for Proposal

DT&E—Development, Test and Evaluation

EMA—Expectation Management Agreement

ENT—Entrance

EVMS—Earned Value Management System

EX—Exit

FCA—Functional Configuration Audit

FQT—Formal Qualification Test

FF—Finish to Finish

FOC—Full Operational Capability

FS—Finish to Start

GFE—Government Furnished Equipment

GFP—Government Furnished Property

IAW—In Accordance With

IMP—Integrated Master Plan

IMS—Integrated Master Schedule

IOC—Initial Operational Capability

IPPD—Integrated Product and Process Development

IPT—Integrated Product Team

LOE—Level of Effort

LRIP—Low Rate Initial Production

NDI—Non-Developmental Item

OFP—Operational Flight Program (software)

ORD—Operational Requirements Document

OSD—Office of the Secretary of Defense

OT&E—Operational Test and Evaluation

PAC—Post-Award Conference

PCA—Physical Configuration Audit

PDR—Preliminary Design Review

PERT —Program Evaluation and Review Technique

PRR—Production Readiness Review

QT&E—Qualification Test and Evaluation

R&M—Reliability and Maintainability

RFP—Request for Proposal

ROM—Rough Order of Magnitude

SRA—Statistical Risk Assessment

SF—Start to Finish

SOO—Statement of Objectives

SOW—Statement of Work

SPO—System Program Office

SRA—Statistical Risk Analysis

SS—Start to Start

TPM—Technical Performance Measure

TRR—Test Readiness Review

WBS—Work Breakdown Structure

Attachment 2**SAMPLE STATEMENT OF WORK (SOW) STATEMENTS**

A2.1. Scope. This appendix provides statements to be used in the Statement of Work (SOW).

A2.2. Samples.

A2.2.1. Integrated Master Plan (IMP). The contractor shall manage the execution of the XYZ program/project using the IMP and its associated IMS as day-to-day execution tools and to periodically assess progress in meeting program requirements. The IMP shall be maintained and shall be updated when it is deemed necessary to reflect changes to the ongoing program, subject to Procuring Activity approval. The contractor shall report on program/project progress in accordance with the IMP at each program management review, at selected technical reviews, and at other times at the Government's request.

A2.2.2. Integrated Master Schedule (IMS). The contractor shall revise their IMS, where necessary, to reflect the Contract IMP. They shall use it as a day-to-day execution tool and to periodically assess progress in meeting program requirements. The contractor shall maintain and update the IMS, when necessary, to reflect Government approved changes in the Execution IMP, or changes in the contractor's detailed execution activities or schedule. The IMS shall include the activities of the prime contractor and their major subcontractors. All contractor schedule information delivered to the Government or presented at program reviews shall originate from the IMS. The contractor shall perform appropriate analyses of the IMS tasks and report potential or existing problem areas and recommend corrective actions to eliminate or reduce schedule impact. (CDRL XXXX, DI-MISC-81183, Integrated Master Schedule).

Attachment 3**SAMPLE SECTION L (INSTRUCTIONS TO OFFERORS) STATEMENTS**

This appendix provides sample statements for use in Section L (Instructions to Offerors) of the RFP. For the samples shown it is assumed the RFP calls for a Contracts Volume and a Technical Volume

Contracts Volume

Since the IMP will be contractually incorporated, a logical place to ask for it in Section L is the Contractual Volume.

Example Section L Instructions

The offeror shall provide the following documents in Section J as part of the Model Contract:

- a. Statement of Work
- b. System Specification
- c. Integrated Master Plan
- d. Contract Work Breakdown Structure

Then the RFP can request the IMP in the appropriate section of the Contractual Volume.

Example

Integrated Master Plan (IMP).

The Offeror shall provide an Execution IMP as part of their proposal submittal. The Offeror's proposed IMP shall be provided as an attachment (in Section J) to the Model Contract. For guidance in development of the IMP, the offerors shall use AFMC Pamphlet 63-5, "Integrated Master Plan and Schedule Guide." The offerors shall then tailor that guidance as required for their particular approach. The following additional requirements apply to the XXX Execution IMP:

(Insert additional requirements IAW [3.1.3.2.](#) of this pamphlet)

Consideration: Again, there is no need to duplicate information from sections 1-3 of this pamphlet in the RFP.

Technical Volume

Since the IMS represents all of the activities necessary to execute the program and illustrates how all of the activities are integrated, the logical place to ask for it in Section L is the Technical Volume, usually as an attachment.

Example Section L Instructions:

Integrated Master Schedule (IMS)

The Offeror shall provide an Execution IMS as part of their proposal submittal. For guidance in development of the IMS, the offerors shall use AFMC Pamphlet 63-5, "Integrated Master Plan and Schedule Guide." The offerors shall then tailor that guidance as required for their particular approach. The following additional requirements apply to the XXX Execution IMS:

(Insert additional requirements for the IMS IAW [3.1.3.2.](#) of this pamphlet)

Attachment 4**SAMPLE SECTION M (EVALUATION FACTORS FOR AWARD) STATEMENTS**

Since the approach the offeror proposes should be reflected throughout the IMP and IMS, mention of the IMP and IMS should be included in the specific evaluation criteria to which they apply:

Example A

An evaluation will be made of the offeror's Integrated Master Plan (IMP) and Integrated Master Schedule (IMS) as they reflect understanding of the program requirements and the soundness of approach to meeting those requirements.

Example B

Technical or Product Area. Each offeror's technical approach will be evaluated using the System/Subsystem Specification, IMP (and its correlation to the IMS), and any proposed deviations to the System Requirements Document requirements as evidence of the offeror's understanding of the requirements specified in the RFP, of the soundness of the offeror's approach, and of a commitment to meeting those requirements. The technical area will be evaluated based on the following three equally weighted factors below:

Factor T.1. (Description)

Factor T.2 (Description)

Factor T.3 (Description)

Example C

Schedule evaluation will be based on

Example D

An evaluation will be made of the offeror's Integrated Master Plan (IMP) and Integrated Master Schedule (IMS) as they incorporate and reflect the offeror's understanding of the requirements and soundness of the approaches described in the offeror's proposal.

Attachment 5

SAMPLE IMP/IMS

The following examples illustrate a generic IMP and IMS for a notional “Widget” Program. In this example, the Widget program consists of taking an existing contractor “Widget” design (Version 1), modifying the design for another mission (Version 1a), and taking both the existing and modified designs through First Article Test, Initial Production, and Delivery. For the IMP, the sample provides only an “action verb” dictionary and a table of events, accomplishments, and criteria, with no IMP Narratives. For the Sample IMS, the sample provides a tabular listing of all IMS activities, along with durations, start finish dates and predecessors. The intent of these examples is not to present a “recommended” IMP/IMS, as an IMP/IMS could be created with significantly different events, accomplishments, and criteria. The intent is to illustrate the hierarchical structure and relationship of events, accomplishments, criteria and tasks.

In this file, four IPTs are referenced for the sample program. They are: Program IPT (PROG), System Engineering, Integration and Test IPT (SEIT), Widget Design and Manufacturing IPT (WDM) and Support IPT (SUPP).

Table A5.1. Sample IMP

Activity #	Event Accomplishment Criteria	WBS REF
A	Event A - Post Award Conference/Baseline Design Review (PA/BDR)-	
A01	Management Planning Reviewed-	
A01a	Program Organization Established	1.2.1
A01b	Initial Configuration Management Planning Complete	1.2.2, 1.2.3
A01c	Program Schedule Reviewed	1.2.1
A01d	Risk Management Program Reviewed	1.2.1
A02	Baseline Design Reviewed	-
A02a	Requirements Baseline Complete	1.3.1
A02b	Review Of Existing Baseline Engineering/Kit Drawings Complete	1.1.1
A03	Post-Award Conference/Baseline Design Review Conducted	-
A03a	PA/BDR Meeting Conducted	1.2.1
A03b	PA/BDR Minutes And Action Items Generated	1.2.1
B	Event B - Final Design Review (FDR)-	
B01	Design Definition Complete-	
B01a	Design Deltas To Baseline Identified	1.3.1
B01b	Drawings Complete (Baseline & Deltas)	1.1.1, 1.3.1

Activity #	Event Accomplishment Criteria	WBS REF
B02	System Performance Assessment Reviewed	-
B02a	Initial Weight Analysis Complete	1.3.1
B02b	Electrical Current Consumption Report Complete	1.3.1
B02c	Initial Reliability, Maintainability, & Availability Predictions Complete	1.3.3
B02d	System Safety Hazard Analysis Complete	1.3.4
B03	Initial Test And Manufacturing Planning Reviewed	-
B03a	Acceptance Test Plan Complete	1.3.2
B03b	Manufacturing Plan Complete	1.2.4
B04	Final Design review (FDR) Conducted	-
B04a	PA/BDR Minutes and Action Item Closure Plan Finalized	1.2.1
B04b	FDR Meeting Conducted	1.3.1
B04c	FDR Minutes and Action Items Generated	1.3.1
C	Event C - Test Readiness Review/Production Readiness Review (TRR/PRR)-	
C01	First Article Build, Assembly And Inspection Complete -	
C01a	First Article Material Purchase And Build Complete	1.2.2, 1.1.2.1
C01b	First Article Assembly And Inspection/Test Complete	1.1.2.1, 1.1.2.3
C02	Support And Testing Equipment Available	-
C02a	Equipment Identified And Acquired	1.2.5
C03	Test Planning Complete	-
C03a	First Article Qualification Test Plan/Procedures (FAQTP) Available	1.3.2
C03b	Acceptance Test Procedures (ATP) Available	1.3.2
C04	Manufacturing Planning Complete	-
C04a	Manufacturing Plan Update Complete	1.2.4
C04b	Facilities Planning Complete	1.2.4
C04c	Quality Improvement Plan Complete	1.3.5
C04d	Initial Quality Conformance Sampling Inspection Results Available	1.3.5
C05	TRR/PRR Conducted	-
C05a	FDR Minutes and Action Item Closure Plan Finalized	1.3.1

Activity #	Event Accomplishment Criteria	WBS REF
C05b	TRR/PRR Meeting Conducted	1.3.2
C05c	TRR/ PRR Minutes and Action Items Generated	1.3.2
D	Event D - Functional/Physical Configuration Audit (FCA/PCA)-	
D01	First Article Test (FAT) Complete-	
D01a	FAT Conducted	1.1.2.1, 1.3.2
D01b	First Article Qualification Report Complete	1.3.2
D02	R&M Qualification Reports Complete	-
D02a	Final Reliability Report Complete	1.3.3
D02b	Maintainability Report Complete	1.3.3
D03	FCA/PCA Conducted	-
D03a	TRR/PRR Minutes and Action Item Closure Plan Finalized	1.3.2
D03b	Data Requirements Completed	1.2.2
D03c	FCA/PCA Meeting Conducted	1.2.2
D03d	FCA/PCA Minutes and Action Items Generated	1.2.2
E	Event E - Initial Production Complete (IPC)	
E01	Version 1 Kit Production And Delivery Complete-	
E01a	Version 1 Subassemblies Complete	1.1.2.2, 1.2.2
E01b	Version 1 Assembly/Integration/Test Complete	1.1.2.2
E01c	Version 1 Packaging And Delivery Complete	1.1.2.2
E02	Version 1a Kit Production And Delivery Complete (15)	-
E02a	Version 1a Subassemblies Complete	1.1.2.4, 1.2.2
E02b	Version 1a Assembly/Integration/Test Complete	1.1.2.4
E02c	Version 1a Packaging And Delivery Complete	1.1.2.4

Table A5.2. Sample Action Verb Dictionary

VERB	DEFINITION
Acquired	Procured and/or fabricated and available
Analysis/ Analyzed	The subject parameter(s) has been technically evaluated through equations, charts, simulations, prototype testing, reduced data, etc.
Approved	The subject item, data, or document has been submitted to the Government and the Government has notified the contractor that it is acceptable. For some data items, it is specified that no response constitutes approval.
Available	The subject item is in place/The subject process is operational/The subject data or document has been added to the Data Accession List.
Awarded	Contract /Subcontract is authorized to begin
Complete(d)	The item or action has been prepared or accomplished and is available for use and/or review.
Concurrence	The Government has expressed its agreement with the contractors proposed design, approach, or plan as documented in either formal correspondence or meeting minutes, presentations, etc.
Conducted	Review or Meeting is held physically and minutes and action plans are generated/Test or demonstration is performed.
Deficiencies corrected	New designs and/or procedures to correct documented deficiencies to requirements have been identified and incorporated into the baseline documentation. May include hardware fixes/retrofits.
Defined	Identified, analyzed, and documented
Delivered	Distributed or transferred to the Government (by DD 250, if applicable).
Demonstrated	Shown to be acceptable by test and/or production/field application.
Developed	Created through analysis and documented.
Documented	Placed in a verifiable form (written/recorded/electronically captured).
Drafted	An initial version (usually of a document) has been created which will require updating to finalize.
Ended	Complete; over
Established	The subject item has been set and documented.
Finalized	Last set of planned revisions has been made or final approval has been obtained.
Generated	Required information has been placed into written form.
Identified	Made known and documented.
Implemented	Put in place and/or begun
Initiated	Begun
In-Place	At the physical location needed, ready to use or to perform.

VERB	DEFINITION
Obtained	Received and documented.
Ordered	Purchase Orders completed
Met	Agreement reached that requirements have been satisfied
Prepared	Information placed into written form.
Provided	Given to in some traceable form (paper, briefing, electronically, etc).
Published	Distributed to team members, either formally (by CDRL), or placement on Data Accession List.
Received	Shipped or delivered item is physically in possession of intended receiver
Refined	Next level of detail has been added or updates made.
Reviewed	Presented for examination to determine status and discuss issues.
Submitted	Formally submitted to the Government.
Trained	Type I training course completed
Updated	Revisions made to documents, metrics, and cost estimates to incorporate contractor and/or Government changes
Validated	Subject item, data or document has been tested for accuracy by the contractor.
Verified	Substantiated by analysis and/or test performed independently of builder/preparer.
Written	Created but not yet published or submitted.

Figure A5.1. Sample IMS.

ID	Activity#	Task Name	Dur	Start	Finish	Predecessors
1		Widget Program	369 d	4/15/03	9/10/04	
2		Contract Award	1 d	4/15/03	4/15/03	
3						
4		Event A - Post Award Conference/Baseline Design Review (PA/BDR)	1 d	5/14/03	5/14/03	41FF
5		Event B - Final Design Review (FDR)	1 d	8/19/03	8/19/03	84FF
6		Event C - Test Readiness Review Production Readiness Review (TRR/PRR)	1 d	12/2/03	12/2/03	135FF
7		Event D - Functional/Physical Configuration Audit (FCA/PCA)	1 d	3/16/04	3/16/04	164FF
8		Event E - Initial Production Complete (IPC)	1 d	9/10/04	9/10/04	170FF
9						
10		Event	1 d	4/15/03	4/15/03	
11		Accomplishment	1 d	4/15/03	4/15/03	
12		Criteria	1 d	4/15/03	4/15/03	
13		Task	1 d	4/15/03	4/15/03	
14	A	Event A - Post Award Conference/Baseline Design Review (PA/BDR)	22 d	4/16/03	5/15/03	
15	A01	Management Planning Reviewed	17 d	4/16/03	5/8/03	
16	A01a	Program Organization Established	10 d	4/16/03	4/29/03	
17	A01a01-1.2.1	Identify contractor team members	10 d	4/16/03	4/29/03	2
18	A01a02-gort	Identify government team members	10 d	4/16/03	4/29/03	2
19	A01b	Initial Configuration Management Planning Complete	17 d	4/16/03	5/8/03	
20	A01b01-1.2.2	Prepare Configuration Management Plan	15 d	4/16/03	5/8/03	2
21	A01b02-1.2.3	Enter Configuration Management Plan into DAL	2 d	5/7/03	5/8/03	20
22	A01b03-1.2.2	Establish Configuration Management team	5 d	4/16/03	4/22/03	2
23	A01c	Program Milestone Schedule Reviewed	10 d	4/16/03	4/29/03	
24	A01c01-1.2.1	Prepare Summary schedule for review	5 d	4/16/03	4/22/03	2
25	A01c02-1.2.1	Review and discuss milestone schedule with SPO	5 d	4/23/03	4/29/03	24
26	A01d	Risk Management Program Reviewed	15 d	4/16/03	5/6/03	
27	A01d01-1.2.1	Document initial risk assessments	10 d	4/16/03	4/29/03	2
28	A01d02-1.2.1	Review Risk Mitigation Activities	5 d	4/30/03	5/6/03	27
29	A02	Baseline Design Reviewed	20 d	4/16/03	5/13/03	
30	A02a	Requirements Baseline Complete	15 d	4/16/03	5/6/03	2
31	A02a01-1.3.1	Review System Performance Specification	5 d	4/30/03	5/6/03	31
32	A02a02-1.3.1	Review System Performance Verification Matrix	20 d	4/16/03	5/13/03	
33	A02b	Review of Existing Baseline Engineering/Kit Drawings Complete	15 d	4/16/03	5/6/03	2
34	A02b01-1.1.1	Review electrical design	15 d	4/16/03	5/6/03	2
35	A02b02-1.1.1	Review mechanical design	15 d	4/16/03	5/6/03	2
36	A02b03-1.1.1	Review interface design	15 d	4/16/03	5/6/03	2
37	A02b04-1.1.1	Identify existing drawing shortfalls	20 d	4/16/03	5/13/03	34SS, 35SS, 36SS
38	A02b05-1.1.1	Conduct Drawing Format Meeting	2 d	5/7/03	5/8/03	34, 35, 36
39	A03	Post-Award Conference/Baseline Design Review Conducted	2 d	5/14/03	5/15/03	
40	A03a	PA/BDR Meeting Conducted	1 d	5/14/03	5/14/03	
41	A03a01-1.2.1	Conduct PA/BDR	1 d	5/14/03	5/14/03	37, 38, 17, 18, 21, 22, 25, 28, 32
42	A03b	PA/BDR Minutes and Action Items Generated	1 d	5/15/03	5/15/03	
43	A03b01-1.2.1	Prepare 1st draft of PA/BDR minutes	1 d	5/15/03	5/15/03	41
44	A03b02-1.2.1	Identify PA/BDR Action Items	1 d	5/15/03	5/15/03	41
45	B	Event B - Final Design Review	92 d	4/16/03	8/21/03	
46	B01	Design Definition Complete	88 d	4/16/03	8/15/03	
47	B01a	Design Deltas to Baseline Identified	88 d	4/16/03	8/15/03	
48	B01a01-1.3.1	Perform requirements delta analysis	22 d	4/16/03	5/15/03	2
49	B01a02-1.3.1	Perform engineering design for deltas	66 d	5/16/03	8/15/03	23, 44, 48

Figure A5.2. Sample IMS.

ID	Activity#	Task Name	Due	Start	Finish	Predecessors
50	B01b	Drawings Complete (Baseline & Deltas)	43 d	4/20/03	6/27/03	
51	B01b01-1.1.1	Preparation of source control and manufacturing drawings	38 d	4/20/03	6/13/03	34SS+10 d, 35SS+10 d, 36SS+10 d
52	B01b02-1.3.1	Review by Engineering Manager	10 d	6/16/03	6/27/03	51
53	B02	System Performance Assessment Reviewed	51 d	4/20/03	7/9/03	
54	B02a	Initial Weight Analysis Complete	17 d	6/17/03	7/9/03	
55	B02a01-1.3.1	Perform calculations and analysis	15 d	6/17/03	7/7/03	49SS+22 d
56	B02a02-1.3.1	Internal review	2 d	7/8/03	7/9/03	55
57	B02b	Electrical Current Consumption Report Complete	45 d	5/7/03	7/8/03	
58	B02b01-1.3.1	Identify electrical equipment	33 d	5/7/03	6/20/03	34
59	B02b02-1.3.1	Calculate electrical current consumption	10 d	6/23/03	7/4/03	58
60	B02b03-1.3.1	Internal review	2 d	7/7/03	7/8/03	59
61	B02c	Initial Reliability, Maintainability, & Availability Predictions Complete	40 d	4/20/03	7/7/03	
62	B02c01-1.3.3	Prepare initial reliability prediction	44 d	4/20/03	6/30/03	51SS
63	B02c02-1.3.3	Prepare initial maintainability prediction	44 d	4/20/03	6/30/03	51SS
64	B02c03-1.3.3	Prepare initial availability prediction	3 d	7/1/03	7/3/03	62, 63
65	B02c04-1.3.3	Internal review	2 d	7/4/03	7/7/03	64
66	B02d	System Safety Hazard Analysis Complete	49 d	4/20/03	7/7/03	
67	B02d01-1.3.4	Perform hazard identification / risk assessment	44 d	4/20/03	6/30/03	51SS
68	B02d02-1.3.4	Identify hazard elimination / risk reduction measures	22 d	5/30/03	6/30/03	67SS+22 d
69	B02d03-1.3.4	Prepare safety assessment report	5 d	6/27/03	7/3/03	68SS+20 d
70	B02d04-1.3.4	Internal review	2 d	7/4/03	7/7/03	69
71	B03	Initial Test and Manufacturing Planning Reviewed	40 d	4/16/03	6/23/03	
72	B03a	Acceptance Test Plan Complete	27 d	5/16/03	6/23/03	
73	B03a01-1.3.2	Prepare Acceptance Test Plan	22 d	5/16/03	6/16/03	44
74	B03a02-1.3.2	Accomplish Test Plan internal review	3 d	6/17/03	6/19/03	73
75	B03a03-1.3.2	Submit Acceptance Test Plan for approval (if required)	2 d	6/20/03	6/23/03	74
76	B03b	Manufacturing Plan Complete	32 d	4/16/03	5/29/03	
77	B03b01-1.2.4	Detail the milestone plan for transition to production	10 d	4/16/03	4/29/03	2
78	B03b02-1.2.4	Prepare Manufacturing plan for inclusion on DAL	22 d	4/30/03	5/29/03	77
79	B04	Final Design Review (FDR) Conducted	70 d	5/16/03	8/21/03	
80	B04a	PABDR Minutes and Action Item Closure Plan Finalized	44 d	5/16/03	7/16/03	
81	B04a01-1.2.1	Review and submit PABDR minutes	2 d	5/16/03	5/19/03	43
82	B04a02-1.2.1	Generate and review PABDR Action Item Closure Plan with customer	44 d	5/16/03	7/16/03	44
83	B04b	FDR Meeting Conducted	2 d	8/18/03	8/19/03	49, 65, 70, 56, 60, 78, 82
84	B04b01-1.3.1	Conduct FDR Meeting	2 d	8/18/03	8/19/03	
85	B04c	FDR Minutes and Action Items Generated	2 d	8/20/03	8/21/03	84
86	B04c01-1.3.1	Prepare 1st draft of PDR minutes	2 d	8/20/03	8/21/03	84
87	B04c02-1.3.1	Identify PDR Action Items	2 d	8/20/03	8/21/03	84
88	C	Event C - Test Readiness Review/Production Readiness Review (TRR/PRR)	145 d	5/16/03	12/4/03	
89	C01	First Article Build, Assembly and Inspection Complete	142 d	5/16/03	12/1/03	
90	C01a	First Article Material Purchase and Build Complete	112 d	5/16/03	10/20/03	
91	C01a01-1.2.2	Material Procurement (existing design - Version 1)	88 d	5/16/03	9/16/03	44
92	C01a02-1.2.2	Material Procurement (delta design - Version 1a)	44 d	8/20/03	10/20/03	84
93	C01a03-1.1.2.1	Fabricate in-house parts (existing design - Version 1)	66 d	5/16/03	8/15/03	44
94	C01a04-1.1.2.1	Fabricate in-house parts (delta design - Version 1a)	44 d	8/20/03	10/20/03	84
95	C01b	First Article Assembly and Inspection Test Complete	54 d	9/17/03	12/1/03	
96	C01b01-1.1.2.1	Assemble first article (Version 1)	20 d	9/17/03	10/14/03	91, 93
97	C01b02-1.1.2.1	Inspect first article (Version 1a)	10 d	10/15/03	10/28/03	95, 104
98	C01b03-1.1.2.3	Assemble first article (Version 1a)	20 d	10/21/03	11/17/03	92, 94
99	C01b04-1.1.2.3	Inspect first article (Version 1a)	10 d	11/18/03	12/1/03	98

Figure A5.3. Sample IMS.

ID	Activity#	Task Name	Dur	Start	Finish	Predecessors
100	C02	Support and Testing Equipment Available	37 d	8/20/03	10/9/03	
101	C02a	Equipment Identified and Acquired	37 d	8/20/03	10/9/03	
102	C02a01-1.2.5	Identify equipment required	5 d	8/20/03	8/26/03	84
103	C02a02-1.2.5	Complete evaluation of in-house support and testing means	10 d	8/27/03	9/9/03	102
104	C02a03-1.2.5	Acquire/lease additional equipment if required	22 d	9/10/03	10/9/03	103
105	C03	Test Planning complete	97 d	6/24/03	11/5/03	
106	C03a	First Article Qualification Test Plan/Procedures (FAQTP) Available	56 d	8/20/03	11/5/03	
107	C03a01-1.3.2	Prepare FAQTP	44 d	8/20/03	10/20/03	84
108	C03a02-1.3.2	Accomplish FAQTP internal review	10 d	10/21/03	11/3/03	107
109	C03a03-1.3.2	Submit FAQTP for approval (if applicable)	2 d	11/4/03	11/5/03	108
110	C03b	Acceptance Test Procedures (ATP) available	56 d	6/24/03	9/9/03	
111	C03b01-1.3.2	Govt approve Acceptance test plan	22 d	6/24/03	7/23/03	75
112	C03b02-1.3.2	Prepare ATP	22 d	7/24/03	8/22/03	111
113	C03b03-1.3.2	Accomplish ATP internal review	10 d	8/25/03	9/5/03	112
114	C03b04-1.3.2	Submit ATP to government	2 d	9/8/03	9/9/03	113
115	C04	Manufacturing Planning Complete	72 d	8/20/03	11/27/03	
116	C04a	Manufacturing Plan Update Complete	12 d	8/20/03	9/4/03	
117	C04a01-1.2.4	Prepare Manufacturing Plan updates	10 d	8/20/03	9/2/03	84
118	C04a02-1.2.4	Place revised manufacturing plan on DAL	2 d	9/3/03	9/4/03	117
119	C04b	Facilities Planning Complete	70 d	8/20/03	11/25/03	
120	C04b01-1.2.4	Identify required facilities	33 d	8/20/03	10/3/03	84
121	C04c02-1.2.4	Put in place required tooling	60 d	9/3/03	11/25/03	120SS+10d
122	C04c	Quality Improvement Plan Complete	55 d	8/20/03	11/4/03	
123	C04c01-1.3.5	Review existing Quality Improvement Plan	22 d	8/20/03	9/18/03	84
124	C04c02-1.3.5	Tailor existing Quality Improvement Plan to Widget	33 d	9/19/03	11/4/03	123
125	C04d	Initial Quality Conformance Sampling Inspection Results Available	50 d	9/19/03	11/27/03	
126	C04d01-1.3.5	Prepare Sampling plan per ANSI/ASQC 2.14-1993	20 d	9/19/03	10/16/03	124 SS
127	C04d02-1.3.5	Select and test/inspect First Article samples	25 d	10/17/03	11/20/03	91SS+22 d,93SS+10 d, 126
128	C04d03-1.3.5	Document results	5 d	11/21/03	11/27/03	127
129	C05	TRR/PRR Conducted	75 d	8/22/03	12/4/03	
130	C05a	FDR Minutes and Action Item Closure Plan Finalized	44 d	8/22/03	10/22/03	
131	C05a01-1.3.1	Mgt review of FDR minutes	5 d	8/22/03	8/28/03	86
132	C05a02-1.3.1	Submit FDR minutes	2 d	8/29/03	9/1/03	131
133	C05a03-1.3.1	Generate FDR Action Item Closure Plan and review with customer	44 d	8/22/03	10/22/03	87
134	C05b	TRR/PRR Meeting Conducted	1 d	12/2/03	12/2/03	
135	C05b01-1.3.2	Conduct TRR/PRR	1 d	12/2/03	12/2/03	97, 103, 113, 121, 128, 99, 109, 114, 87, 121
136	C05c	TRR/PRR Minutes and Action Items Generated	2 d	12/3/03	12/4/03	
137	C05c01-1.3.2	Prepare 1st draft of TRR/PRR minutes	2 d	12/3/03	12/4/03	135
138	C05c02-1.3.2	Identify TRR/PRR Action Items	2 d	12/3/03	12/4/03	135
139	D	Event D - Functional/Physical Configuration Audit (FCA/PCA)	151 d	8/20/03	3/17/04	
140	D01	First Article Test (FAT) Complete	48 d	12/2/03	2/5/04	
141	D01a	FAT Conducted	26 d	12/2/03	1/6/04	
142	D01a01-1.1.2.1	First articles shipped to _____	4 d	12/2/03	12/5/03	97, 99
143	D01a02-1.3.2	Conduct first articles acceptance test	22 d	12/8/03	1/6/04	142, 138
144	D01b	First Article Qualification report complete	48 d	12/2/03	2/5/04	
145	D01b01-1.3.2	Create First Article Inspection report	10 d	12/2/03	12/15/03	97, 99
146	D01b02-1.3.2	Prepare _____ Compliance Data	22 d	1/7/04	2/5/04	84, 143
147	D01b03-1.3.2	Create Qualification by Similarity report	22 d	1/21/04	1/14/04	145

Figure A5.4. Sample IMS.

ID	Activity#	Task Name	Uur	Start	Finish	Predecessors
148	D02	R&M Qualification Reports Complete	88 d	8/20/03	12/19/03	
149	D02a	Final Reliability Report Complete	88 d	8/20/03	12/19/03	
150	D02a01-1.3.3	Perform reliability analysis	44 d	8/20/03	10/20/03	84
151	D02a02-1.3.3	Prepare final Reliability Report	44 d	10/21/03	12/19/03	150
152	D02b	Maintainability Report Complete	88 d	8/20/03	12/19/03	
153	D02b01-1.3.3	Perform maintainability analysis	44 d	8/20/03	10/20/03	84
154	D02b02-1.3.3	Prepare final Maintainability Report	44 d	10/21/03	12/19/03	153
155	D03	FCA/PCA Conducted	74 d	12/5/03	3/17/04	
156	D03a	TRR/PRR Minutes and Action Item Closure Plan Finalized	46 d	12/5/03	2/10/04	
157	D03a01-1.3.2	Mgt review of TRR/PRR minutes	2 d	12/5/03	12/8/03	137
158	D03a02-1.3.2	Submit TRR/PRR minutes	2 d	12/9/03	12/10/03	157
159	D03a03-1.3.2	Generate TRR/PRR Action Item Closure Plan and review with customer	44 d	12/11/03	2/10/04	138, 158
160	D03b	Data Requirements Completed	25 d	2/6/04	3/11/04	
161	D03b01-1.2.2	Gather documents for PCA/FCA	5 d	2/6/04	2/12/04	144, 145, 146, 147
162	D03b02-1.2.2	Government review PCA/FCA materials	15 d	2/20/04	3/11/04	161SS+10 d
163	D03c	FCA/PCA Meeting Conducted	3 d	3/12/04	3/16/04	
164	D03c01-1.2.2	Conduct FCA/PCA Meeting	3 d	3/12/04	3/16/04	162, 161, 154, 159
165	D03c02-1.2.2	Review and approve Functional Baseline	3 d	3/12/04	3/16/04	164SS
166	D03c03-1.2.2	Review and approve Physical Baseline	3 d	3/12/04	3/16/04	165SS
167	D03d	FCA/PCA Minutes and Action Items Generated	1 d	3/17/04	3/17/04	
168	D03d01-1.2.2	Prepare Isdraft of FCA/PCA Minutes	1 d	3/17/04	3/17/04	166, 164, 165
169	D03d02-1.2.2	Identify FCA/PCA Action Items	1 d	3/17/04	3/17/04	164, 166, 165
170	E	Event E - Initial Production Complete (IPC)	127 d	3/18/04	9/10/04	
171	E01	Version 1 Kit Production and Delivery Complete	127 d	3/18/04	9/10/04	
172	E01a	Version 1 Subassemblies Complete	85 d	3/18/04	7/14/04	
173	E01a01-1.1.2.2	Generate bill of material	5 d	3/18/04	3/24/04	168, 169
174	E01a02-1.1.2.2	Generate operation/routing sheets	5 d	3/18/04	3/24/04	168, 169
175	E01a03-1.2.2	Order components/subassemblies and raw material	10 d	3/25/04	4/7/04	
176	E01a04-1.1.2.2	Receive raw material	44 d	4/23/04	6/22/04	175FS+10 d
177	E01a05-1.1.2.2	Fabricate in-house components/subassemblies	56 d	4/29/04	7/14/04	176SS+5 d
178	E01a06-1.1.2.2	Receive purchased components/subassemblies	44 d	5/10/04	7/8/04	176FS+22 d
179	E01b	Version 1 Assembly Integration/Test Complete	68 d	5/31/04	9/1/04	
180	E01b01-1.1.2.2	Assemble/integrate Version 1 Kits	66 d	5/31/04	8/30/04	177SS+22 d, 178SS+5 d
181	E01b02-1.1.2.2	Test Version 1 Kits	66 d	6/2/04	9/1/04	180SS+2 d
182	E01c	Version 1 Packaging and Delivery Complete	72 d	6/3/04	9/10/04	
183	E01c01-1.1.2.2	Package Version 1 kits	66 d	6/3/04	9/2/04	181SS+1 d
184	E01c02-1.1.2.2	Ship Version 1 Kits	71 d	6/4/04	9/10/04	183SS+1 d
185	E02	Version 1a Kit Production and Delivery Complete (15)	127 d	3/18/04	9/10/04	
186	E02a	Version 1a Subassemblies Complete	85 d	3/18/04	7/14/04	
187	E02a01-1.1.2.4	Generate bill of material	5 d	3/18/04	3/24/04	168, 169
188	E02a02-1.1.2.4	Generate operation/routing sheets	5 d	3/18/04	3/24/04	168, 169
189	E02a03-1.2.2	Order components/subassemblies and raw material	10 d	3/25/04	4/7/04	187, 188
190	E02a04-1.1.2.4	Receive raw material	44 d	4/23/04	6/22/04	189FS+10 d
191	E02a05-1.1.2.4	Fabricate in-house components/subassemblies	56 d	4/29/04	7/14/04	190SS+5 d
192	E02a06-1.1.2.4	Receive purchased components/subassemblies	44 d	5/10/04	7/8/04	189FS+22 d
193	E02b	Version 1a Assembly Integration/Test Complete	66 d	5/31/04	9/1/04	
194	E02b01-1.1.2.4	Assemble/integrate Version 1a Kits	66 d	5/31/04	8/30/04	191SS+22 d, 192SS+5 d
195	E02b02-1.1.2.4	Test Version 1a Kits	66 d	6/2/04	9/1/04	194SS+2 d
196	E02c	Version 1a Packaging and Delivery Complete	72 d	6/3/04	9/10/04	
197	E02c01-1.1.2.4	Package Version 1a kits	66 d	6/3/04	9/2/04	196SS+1 d
198	E02c02-1.1.2.4	Ship Version 1a Kits	71 d	6/4/04	9/10/04	197SS+1 d